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REMARKS UPON A POPULAR FALLACY CONCERNING MEXICO AND HER MILITARY RESOURCES.

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"I have remarked that it is not well to create a too great contempt for the enemy, lest the morale of the army should be shaken if it encounters an obstinate resistance."—Jomini.

THE discussion, carried on by a group of officers at one of our southern frontier posts, had certainly waxed warm, and finally culminated in the assertion: "Well, you may say what you please, I would like nothing better than to be ordered to invade Mexico with 50,000 men, and I would get there, too." This view of the matter seemed to be acquiesced in by all present, and our party soon after dispersed. The subject under discussion was the "Cutting affair," wherein a tramp editor, named Cutting, had been arrested in Mexico for some offense, real or alleged, and the fact having been blazoned forth all over the country, had elicited some severe strictures upon the Government for not at once offering Mexico the alternative of giving up the man or fighting. The newspapers and the public in general discussed the prospect of war, and the universal opinion seemed to be that very few men and very little time would be needed for our army to make a second triumphal entry into the City of

The map accompanying this paper has been compiled and made by Lieutenant Cruse.

C. C. C. Carr. Editor.

Mexico. In fact, the people of the United States—from the well-informed literary man to the day laborer—seemed to forget that our prospective antagonist also had resources and military power; certainly not so great as our own, yet quite extensive, and not to be so lightly overcome as we might imagine.

History shows us that some of the most terrible disasters that have ever fallen to the lot of nations in war, have been those resulting from an incorrect estimate by the beaten nation—who was at first the assailant—of the resources and military power of the nation which ultimately triumphed, but which, at the outset, had, apparently, no chance against her seemingly all-powerful adversary. The Moscow campaign is a fair example of this. NAPOLEON had on his side his own wonderful genius, his trained generals, and the resources and armies of nearly all Western and Central Europe [JOMINI states, on page 344, Vol. II, "Life of Napoleon," that this army was composed of French, Poles, Austrians, Prussians, Italians, Bavarians, Westphalians and Saxons], and it cannot be said that he was not a prudent calculator in all matters pertaining to finance and war. He prepared to attack Russia, who, without allies in that part of the theater at least, and with resources far inferior to those of her antagonist, was, it seemed, poorly able to resist the overwhelming tide that poured in upon her. Still, as we know, NAPOLEON was beaten, and the soldiery of Russia, aided by the severe climate of the country and the unvarying patriotism of the leaders, drove back the trained armies of the invaders.

A still more modern and striking instance is given in the Franco-German War, when the French fought as well as they ever did, but the first error in over-estimating their own resources and under-estimating the development of Germany as regards military training and unity, was never atoned for until Paris was captured and the indemnity was paid. To make the case apply with greater force to our own situation, I will say that it was *not* from lack of resources—see how quickly the immense war levy was raised and paid—nor yet from lack of bravery in the soldiers, nor even good military leaders,* that France was conquered, but by her towering self-confidence, which caused her to depend too much upon past traditions and pay too little heed to actual conditions.

The question that I submit then, is, may not we of the United States fall into a similar error as regards the condition and military resources of our neighbor, Mexico, and might not such a mode of thinking generate a similar lack of preparation on our part, so that

*VON MOLTKE's estimation of CHANZY.

when the clash of arms came, the weaker power might give us a long and bloody struggle for the victory.

A key to the whole situation is found in the remarks so often seen in the newspapers and heard from the people whenever any little incident such as the "CUTTING case" occurs, and there arises some talk as to what could be done if war was declared, the general import of such braggadocio being well illustrated by the following extract from a great and influential newspaper:* "The fellows who sneer at our 'little army' and our 'old hulk of a navy,' forget that there are 50,000,000 of people behind them. UNCLE SAM can wave that old flag from the top of the National Capitol, or from some peak on the Rocky Mountains, and sound a bugle call, and ships would fall in line, and 1,500,000 men would answer '*Ready!*'"

While we should not be pessimistic regarding the wonderful resources and latent military power of our country, still, that we should have such a fallacious idea that our undeveloped strength needs no preparation is to be deplored, and may, I insist, bring us trouble and disaster in case of war with Mexico. If men and resources (both undeveloped) were all that are needed in war, then certainly China would be the greatest nation on the face of the earth, as it *thinks* it is. In fact, we might *not* be able to succeed *at first* in a military invasion of Mexico, and furthermore, if we started in without adequate preparation, and relying on past traditions, we might be ultimately defeated in our attempts against that nation. Many Americans, influenced by these traditions instead of actual conditions, may think it absurd to suppose that a half civilized nation of 12,000,000 people, could for one moment cope with a great and enlightened one of 62,000,000. But numbers and resources do not always win the victory; if so, how is it that the United States ceased to be a dependency of Great Britain. It may be urged that England was obliged to send the armies against us, across the sea; that the conditions are not the same; and that the point is not fairly taken. Now, that is exactly the point that I wish to make; that although the two nations (the United States and Mexico) have actual boundary lines—identical, of great extent, 1,900 miles—still for an army from the United States to reach what is really Mexico, *i. e.*, the great central plateau around the capital, where the population, wealth and resources of the entire country are practically located, it would have to cross a space as difficult and almost as far in distance, and a great deal farther in danger, than that over which England had to send her

**Chicago Inter-Ocean.* Quoted from Major KING'S article, *Military Service Institution*, December, 1884.

armies against us in either the Revolution or the War of 1812. And herein lies a most wonderful power of defense for Mexico, because to us she is as inaccessible as if she were an island 1000 miles from our coasts, and had numerous and daring privateers to annoy our convoys and troop ships.

Facts are demanded, and I give them: First, as regards her army and its capabilities; next a view of the country and the railroads situated in what might become the theater of war.

THE MEXICAN ARMY.

The latest reports of the War Minister of that country show the army to be composed of (1), the Permanent Army, (2), the Reserve, and (3) the General Reserve; a grand total of 160,000 men of all arms. And it is claimed that this number could be armed, equipped and made ready for action in a very short time. The permanent army, corresponding to our regular army, and under the direct control of the Federal Government, actually in service, and ready for immediate action, is composed of, cavalry, 5,500; artillery, 2,000; engineers, 700; infantry, 17,500; and Rurales (the crack cavalry corps of the nation), 2,000. To this number may be added as also available for immediate use, although not regarded as a part of the army, the Gendarmes (mounted), 500 strong; total 28,200. Taken as a whole, these troops are well armed and equipped, and suited to the demands of the occasion.

INFANTRY.

As to the infantry, those of us, who have seen its wonderful marching qualities; the ease with which the men are subsisted and cared for, and more especially its absolute independence of trains and camp equipage while in the field, are not inclined to rank it low in the scale of soldiery, even though made up of peons and convicts, as nearly all the battalions on the northern frontier undoubtedly are at present. In his last annual message to the Mexican Congress, however, President DIAZ set forth the evils of such a system and recommended that a newer and more progressive one be adopted. No doubt the new system is now in operation and will tend to get a better class of men in the army. The well trained and disciplined infantry in the interior and near the capital ask no favors of any infantry that we might bring against it, *more especially* on the defensive.

CAVALRY.

The Rurales and Gendarmes are superbly mounted and equipped, have great *esprit de corps*, and would be invaluable for use as guides

and to keep touch of the enemy, from their intimate knowledge of the country and the high grade of duties required of them. They are probably better in their sphere than any cavalry that we have. The regular cavalry is well horsed and equipped, but not quite so well armed as our own. Nor are they rusting for want of actual field training, and in guerilla and Indian warfare have shown high military spirit and efficiency. The country through which our lines of communications would run is well suited to the action of this arm, and no doubt our armies would find themselves very much harassed with the guerilla warfare, to which the cavalry of the Mexicans has shown itself peculiarly adapted.

I will admit that the rank and file do not strike the average beholder with any awe, but on the contrary, the white cotton trousers, sandaled feet and general costume may excite ridicule; also the general low level of intelligence works against any favorable impression; but it must be remembered that they (the common soldiers) are exactly the people to exhibit desperate bravery, if well led, and if popular passion happens to be against the hostile nation, to an unusual extent—not always the case. Here let me remark, that the influence of the Americans who have gone into Mexico and are in various business enterprises, is acknowledged to be for good, and is therefore favored by the intelligent, progressive and influential citizens of that country; still to the lower, uneducated masses (such as would make up the armies), we are still "Gringoes," and are held in great disfavor. So that in event of war we would have to meet fanaticism as well as patriotism.

ARTILLERY.

The latest reports concerning the Mexican Field Artillery (Lieutenant G. P. SCRIVEN) show that our neighbor is as well prepared in that respect as we are. The peace status of this arm is twelve light batteries—steel breech-loading guns, Austrian pattern, changing to Krupp now—and twelve howitzer batteries for mountain service, each with sufficient men and *mules* to put them in a good state of efficiency.

So that taking everything into consideration, Mexico shows herself alive to the exigencies of the occasion, and would prove rather a dangerous combatant even if we left out of consideration the barriers which Nature has placed around her, and which tend to assist her to a greater degree than a quadruple increase in the strength of her army would do.

Since we Americans are prone to base expectations of future suc-

cess against Mexico upon the ease with which our armies conquered the country in 1847, let us critically look at the condition of that nation at the date of the "American Raid," as it has been characterized by a very intelligent military writer, and see how it compares with the situation of to-day. The country had but a short time before achieved its independence, only to be overwhelmed by a series of revolutions, stirred up by ambitious generals; the central Government had no ready means of communication with the various States; no regular system of taxation was in operation, and funds were accordingly lacking; a great mass of the people cared nothing for the war or its objects; arms and equipments were scarce and unobtainable, and in fact, every *moral* and other incentive needed to make the war a success for the Mexicans was absent.

The internal condition of the country is very clearly shown by an American author (BISHOP) in the following words: "There were not less than eleven changes of government, chiefly violent, during the short course of the war (1847). In February and March of the year in which in September the invaders made their entry, there had been fighting in the streets of the capital for well nigh a month between two presidents, neither strong enough to put the other down. Want of courage is not a Mexican failing. It was want of leaders, unity, everything that gives steadiness in a great crisis."

I have no intention of attempting to diminish the luster of the achievements of the little band of Americans in 1847, because it must always rest as a great and daring deed for an army of 15,000 men to conquer a nation of 7,000,000 people under any circumstances.*

The aspect of affairs has changed very much for the better since that time, both for the United States and Mexico; relatively more for Mexico than ourselves, however. Revolutions, the curse of Mexico, may be fairly considered a thing of the past, and thanks to American enterprise and money, railways connect the capital with the most isolated parts of the country, and the Federal Government can at once overawe any resistance to its authority promptly and effectively, and furthermore it does it. As regards finances, the showing made in the report of August, 1890, was very flattering.

In confirmation of the ideas set forth above, I take the liberty of quoting from JANVIER'S article in *Harper's Magazine* for November, 1889:

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*The number given is that of General SCOTT'S army—*available.* The report of the Adjutant-General in 1848 shows that the entire force used from beginning to end as follows, viz: Regulars, 26,922; volunteers, 73,932; a grand total of 100,854 men, of whom 25,000 were lost by death in battle and disease; mostly the latter. Very few people have ever imagined that these figures ever assumed such proportions as shown above.

"But on dress parade these same easy going soldiers present a very creditable appearance. Indeed, I never saw anywhere a more soldierly body of men than the force that marched in review past the President on the 5th of May, 1885. At this time, differences with Guatemala, growing out of the interminable boundary dispute, threatened war, and rumors were also flying about that a certain prominent general contemplated trying his hand at getting up a revolution. Whatever may have been its object, the Government at this time assembled in and around the City of Mexico, an army of 20,000 men of all arms, and on the 5th of May, this force splendidly armed and equipped was paraded through the streets of the capital. * * * There was, moreover, a prompt, business-like air about the demonstration that produced an effect very unlike that of an ordinary parade or review. The marching pace of the infantry was almost a double-quick; the cavalry frequently moved at a trot, and some of the batteries dashed by at a gallop."

The author very sagely concludes that such an army is not to be lightly regarded, either at home or abroad, a sentiment which must be acquiesced in by every one who has ever examined into the matter at all.

NATURE OF THE COUNTRY.

Let us now consider the physical characteristics of the country in which an invading army would be compelled to operate, premising our views on this subject by a quotation from "Napoleon's Maxims" as follows: "Obstacles that are difficult to surmount in the order of difficulty are, (1) Deserts, (2) Mountains, (3) Rivers." Our researches will show that, as concerns an army, *almost any* line we may take contains deserts, and that *every* line contains mountains of the most difficult and rugged nature. All writers on the subject unite in saying that the population, riches and resources of Mexico, are concentrated upon the great central plateau, Anahuac, the boundaries of which are two east and west lines, one drawn through San Luis Potosi on the north, the other through Orizaba on the south, and it is equally conceded by all, that for a hostile army to conquer the nation, it would necessarily have to occupy this portion of the country; and it is equally a fact, which a careful examination of the map of Mexico will show, that any route over which the invading army would move would offer great difficulties of supply, and be extremely favorable for the defense at every step. Let us consider each of these lines, its advantages and disadvantages, in detail.

1. *The Vera Cruz* route, which at the outset necessitates transportation of troops for quite a distance by water, (which *might* be rendered impracticable if Mexico should have an ally with a fleet) then a successful landing at or near Vera Cruz, which beyond the

trouble and expense, and the danger of disaster arising from poor harbors, would not be particularly dangerous, since we have the fleets and could obtain the necessary transports readily enough. Once landed, however, the difficulties commence. The southern route used by the French, from Vera Cruz to the capital, the City of Mexico—necessarily the object of an invading army—is at present occupied for nearly its entire length by the *Mexican Railway*. This line is 265 miles long, has English equipments, was built by an English company, and, of course, would have to be depended upon for transportation of supplies and munitions of war, so we trace it in detail. Along the coast is the section of country known as the Tierra Caliente, extending into the interior for about a width of eighty miles—a deadly strip for Americans on account of the fevers; and an army, not acclimated, held there for three months in *ordinary* seasons would be decimated by disease, and in some seasons its efficiency would be entirely destroyed by the prevalence of yellow fever.

Having passed over this strip the terrain rises suddenly to Orizaba, 4,027 feet above sea level. In attaining this level the road traverses a terrific grade and crosses the Barranca de Matlac on an iron bridge 350 feet long and ninety feet high—easy to destroy and hard to replace—as it must be understood that we probably have no detailed plans of this road, its grades, bridges, etc., as of all the others, nor were the bridges made in the United States.

Once in Orizaba the army might be in a good situation as regards health, but the country does not abound in supplies, and before reaching it, there are several fine defensive positions for the Mexican army. A few miles beyond Orizaba the road runs in the Barranca del Infernillo with numerous bridges and tunnels, and very steep grades, thence into the plain of La Joya, a beautiful and well supplied country. Of course a strenuous resistance might be expected in the Barranca, not alone at one point, but at several, and severe fighting could not be avoided.

After crossing the plain of La Joya, the road rises from Maltrata an additional 3,600 feet in a very short distance, and attains the plateau or Tierra Fria at an altitude of 7,922 feet at Boca del Monte, 108 miles from Vera Cruz. At this point or near it, the invaders would probably have to meet all the available forces of the enemy in battle, because here must be fought the battle for Puebla, the possession of which by the Americans would insure supplies and safety until a further advance towards the capital could be made.

I have not considered the old Camino Real from Vera Cruz to the

capital, because it is doubtful if an army could use it as a line of communication at present, as it has not been kept in repair since the railway has been in operation. If it could be used, the very strong points along its extent would now be held with much greater tenacity than ever before, in fact, it might be rendered impregnable at several points. After gaining Puebla, either by road or railway, the invading army would then have to do its hottest fighting to get the capital, and under the present favorable circumstances the Mexicans might reverse the victories of Contreras, Cherubusco and Molino del Rey.

The route taken by the American army under General SCOTT in 1847, through Jalapa, Perote, etc., from Vera Cruz, is paralleled and occupied to some extent by a new narrow gauge railroad—*the Interoceanic*—which starting from Alvarado on the Gulf, just southeast of Vera Cruz, passes the cities mentioned, crosses the Mexican railway at Huamantla, thence to Puebla, thence to Otumba, thence to the capital. This road was only finished in 1891, is 293 miles long, gauge three feet, steel rails, and running as it does, offers all the difficulties and strong defensive positions that the invading army encountered in 1847. At the present time this railroad is under construction from the City of Mexico to the Pacific Coast at Acapulco—the finest harbor on that coast—and the indications are that it will be the first road completed to the Pacific at any point. The length of the line from the capital to Acapulco will probably be 386 miles, of which at least ninety-five miles are constructed and in operation. After Puebla was taken, both roads, the Mexican and Interoceanic, could be used to supply the army; hence my reasons for saying that Puebla would be a key point to all operations based on Vera Cruz. (See accompanying *map of Mexico.*)

2. Going north the next line that attracts our attention is a branch of the *Mexican Central Railway*—standard gauge, four feet eight and one-half inches—completed in 1889, and extending from Tampico on the Gulf, to San Luis Potosi, where it connects with the Mexican National from Laredo, thence on to Aguas Calientes, where it connects with the main line of the Mexican Central from El Paso. It was originally intended that this branch should extend across Mexico from Tampico to San Blas on the Pacific, but no construction is going on at present, and the western portion remains unfinished. This road, rolling stock and bridges, are all of American construction. The grade is very steep from Tampico to San Luis, where it attains the plateau at an elevation of 6,150 feet, the distance between the two places being 275 miles. From Tampico to Aguas Calientes is

415 miles. I am inclined to think that this line offers more advantages to an invading army than any other, for the reason that whilst *en route* it would be practically safe from flank attack, and a second army lightly equipped might move from Laredo to coöperate. Of course, in all the instances the enemy would destroy the bridges and remove the rolling stock in retiring, and the roads would have to be rebuilt as the army advanced. With the particular roads under consideration, this rebuilding would be a *costly* but not necessarily difficult operation, since we have all the necessary plans, etc., in this country, or at least they could be obtained.

The port of Tampico would form a better base than Vera Cruz, being closer to our ports than the latter place, and now that the bar across the mouth of the Rio Panuco, has been partially removed, vessels of reasonable tonnage can enter. The Rio Panuco itself is navigable for 150 miles for light draught stern-wheel boats, such as are found on our western waters (Captain DORST, Fourth Cavalry, 1883). Tampico itself is very hot and unhealthy, but no more so than Vera Cruz. There are no large cities on this line, hence few supplies until the region in the vicinity of San Luis is reached. Once there and supplies collected, the invader could soon open the country to Aguas Calientes, and then all the railroads leading from Texas would fall into his hands and be available for use as lines of supply for future operations against the capital. The direction of the Mexican attack might compel this invading army to form front to a flank, but the danger of defeat in such a position would be very materially lessened in this instance by the fact that if the line to Tampico were lost, the beaten army might regain its base through Monterey, along the Mexican National, at the expense of great losses and hardships, but not total disintegration. Hence the provision for a coöperating army along the Mexican National.

This line probably offers more advantages with less probability of excessive loss than any other that we may consider. The advantages of this route are still further enhanced by the fact that a new road, the Monterey and Mexican Gulf R. R., (standard gauge) leading from Monterey through Linares and Cindad Victoria to Tampico is built and finished, thus giving an all rail route from the United States to Tampico. This road is also projected and surveyed to run from Tampico directly south to the City of Mexico, and there is some probability of its being built. If built it would give the most direct all rail route from the United States to the capital. After reaching San Luis, the task of reaching the capital—distance 362 miles—still remains, but the movement would be made with the army well

supplied and the Commanding General not particularly worried about his lines of communication with his base, which is quite extensive, and if the raiding parties of the enemy cut one or more of the lines of communication, the army can still be supplied by the others.

3. Next in order comes the *Mexican National Railway* (narrow gauge, three feet), which leaving Texas at Laredo, rises to the side of the main plateau near Monterey, after traversing a distance of 168 miles, thence up a very steep grade to Saltillo, 236 miles, where it reaches what is practically the plateau, but where water and supplies of all description are very scanty. Not the least of SANTA ANNA's achievements as a general and leader was the feat of taking his army in 1846–7 across the sterile plain, which, enclosed on all sides by mountains, stretches waterless and treeless from near Saltillo to the vicinity of San Luis, about 160 miles. (This belt or strip of country is crossed by all the railroads coming from the United States, but none of it is so absolutely a desert as the part of which I speak just now.) In his report of the march to attack the American army under General TAYLOR, and of the battle of Buena Vista, he states the condition of his army pretty fairly, as follows:

"The army has done more than could be expected under the laws of Nature. It had just been formed, and as yet had not acquired discipline or military habits, yet in marching to the combat it overcame difficulties which might have subdued the stoutest hearts. After a march of sixty miles, forty-eight of them without water and without other food than a single ration issued at Encarnacion, it endured the combat for two days. * * * From the rigor of the climate, the badness and scantiness of the subsistence, the entire want of bread and the bad quality of the water used in our former bivouacs, a bowel complaint had broken out in the army, which rendered inefficient at least half of it. The countermarch of the army was indispensable, but not on account of the enemy. * * * We must bear in mind that we have to operate in a region deficient of all resources, and that every thing for subsistence has to be carried along with the soldiery."

These observations, coming from a Mexican general, concerning a Mexican army, acclimated and inured to hardship, and acquainted with the country, are certainly good evidence, and we pause to think what *might* have happened had SANTA ANNA remained on the defensive near San Luis, and General TAYLOR had attempted to cross the plain with soldiers not acclimated, and without sufficient transportation and forage. (He was continually urged to do this from Washington.)

The aspect of this country has changed very little since the advent of the railroad, and military travelers of late years (notably Captain DORST, who made a horseback reconnaissance from Monterey

to San Luis) are of the opinion that with the artificial tanks destroyed, and the very few springs filled up, it would be next to impossible to cross this stretch of country with an army of any size. From Laredo to the City of Mexico by this route is 839 miles, and fully half of this distance is over country where it would be difficult to move an army, even if unopposed.

4. The *International Railroad* (four feet eight and one-half inch gauge) runs from Eagle Pass, Texas, to Torreon Junction, where it connects with the Mexican Central, after traversing a distance of 450 miles. In 1846–7 General WOOL led a column from Texas along the route at present traversed by this railway, with the intention of operating against Chihuahua and the northern provinces, but having reached Monclova (now an important station on the railroad), the hardships of the country and lack of ordinary supplies caused him to give up the attempt, and crossing the mountains by a favorable pass he joined General TAYLOR at Saltillo, and was, fortunately for the American army, with him at the battle of Buena Vista. The country traversed by this road is even less adapted to the movements of an army than that of the Mexican National, and there are no large cities throughout its entire length. This road is important, however, from the fact that it is broad gauge and is really the Mexican Central, avoiding the long distance from El Paso, through Chihuahua to Torreon, and in addition it is sensibly parallel to the Mexican National, with several branches now building, which are intended to cross the space between the two. One of these branches leaves the main line at Venadito, runs to Monterey and is continued thence to Cuidad Victoria, and as stated before, enters Tampico. Another branch leaves the main line at Jaral, and is intended to cross to Saltillo. (See map.) Another fact that would favor the use of these two lines is that the stockholders of the Mexican National have voted to lay a third rail on their line so as to run broad gauge cars over it, without change, to the City of Mexico. From the latest information obtainable, this work is now being done. One serious objection to the use of this road as a line of operations is that Torreon Junction is on the plain at the foot of the Sierra Madres, and after capturing it no supplies are gained, and there still remain 706 miles to be traversed to gain the capital, and the country around Zacatecas abounds in strong defensive positions. By using the Tampico route or the line of the Mexican National, all these defiles are turned and without fighting any harder than would be necessary to do if we attempted to capture San Luis by an advance from Zacatecas or Aguas Calientes. (See map.)

5. Of the main line of the *Mexican Central Railroad* (standard gauge, four feet eight and one-half inches, and laid with steel rails weighing fifty-six pounds per foot) from El Paso to its junctions with the roads already named (Torreon—Aguas Calientes), it is scarcely necessary to treat, as the possession of the State and City of Chihuahua would have no particular effect upon the war for either side. The Mexicans could readily give it up, and its possession by the United States would be of no military advantage, even for use as a depot of supplies, as the distances are too long. From El Paso to Chihuahua is 224 miles; from Chihuahua to Torreon is 294 miles, and from El Paso to the City of Mexico is 1,224 miles. Rather startling figures for a general, when we think that NAPOLEON'S longest line of communications, from Köenigsberg to Moscow, was 675 miles, and that it then traversed a country more thickly settled and cultivated than that of which we write; at least until the plateau is reached.

6. The branch of the Atchison, Topeka & Santa Fé Railroad, called the Sonora Railroad, from Benson to Guaymas, is also of no particular importance, as the State of Sonora is isolated by the impassable Sierra Madre Mountains, and all communication with the capital must be made by the sea from Guaymas to San Blas or Acapulco, or through the United States from El Paso to Nogales.

7. On the Pacific coast there are no railroads leading to the capital or any interior city. One is built from San Blas to Tepic, not over thirty miles, and stops at the foot of the mountain range of the Sierra Madre. Running out to meet this is a branch of the Mexican Central, which, leaving the main line at Irapuato, terminates at present at the great City of Guadalajara, but is graded to Ameca, some distance further. So far, however, capitalists have hesitated about incurring the enormous expense necessary to construct the road on the western side of the mountain slope. Looking at this in the light of a future line of invasion, the fact that this road is *incomplete* is very advantageous to the Mexicans, since they are enabled to draw supplies from all that portion of the country which is very rich and productive; at the same time this line is absolutely unattainable by the invading army until it has advanced along the line of the Mexican Central as far as Irapuato.

A small branch of the Mexican National (narrow gauge) runs from Manzanillo to Colima, and it is the ultimate intention of this company to complete this road to the capital, through Patzcuara and Morelia, both large and important cities. This road is also in operation from the capital to Patzcuara. The gap from Colima to

Patzcuara still exists, and for the same reason as shown above in the case of the road from Ameca: that is, the great expense necessary to grade the road over the mountain. From San Blas to Mexico by road (very bad) is 615 miles, and only about half this distance is covered by the railroad now. Both San Blas and Manzanillo are very unhealthy for foreigners, and it is hardly possible that any advance could be made on the capital from these ports.

8. As stated before, there is every prospect that the *Interoceanic* Railway (narrow gauge, three feet) will in the near future be completed from Acapulco to the City of Mexico, but in the meantime the portion from that city to Yantepic is built and in operation through a fertile and well cultivated region, abounding in food products of all kinds, and furthermore, this branch would be safe from the invading army up to the very last moment.

Reviewing the lines, we see that the shortest one—that from Vera Cruz—is at the same time the most difficult naturally, and is especially favorable to the defense. Besides, the lines so concentrate and cross near the City of Mexico that the defenders could in a short time draw reinforcements from all parts of the country and mass an overwhelming force against the invaders, and in case the Americans attempted to advance along two separate lines, the country is of such a nature that by using a small containing force against one army, a great preponderance of force could be brought against the other. In fact, the *direction* of the railways is so much in favor of the Mexicans, that with their army of 160,000 men it might readily happen that they could bring 150,000 against the Americans near San Luis one week, and then within ten days reinforce with this same army the containing force of 10,000 confronting the enemy on the Vera Cruz route, so that it would number 150,000.

In the meantime the two American armies, say of 125,000 each, would be struck by superior numbers, and although perhaps aware of the movement, could not help each other because of the immense mountain ranges between them, nor could either strike a blow at the Mexican lines of communications, because their *direction* is such that they would be constantly covered. Almost invariably, high impassable mountains separate any two lines of railway until the high plateau near the capital is reached (with the single exception pointed out, the Mexican National and International Railways), so that for the invaders, coöperation or mutual reinforcement is well nigh impossible. And just here, I would suggest that it is well to bear in mind the fact, that people of Spanish descent always fight with desperate bravery behind stone walls and under cover, even

though these same men may be very quickly defeated in the open plain. This is historical, and is exemplified in numerous instances in the Peninsular War, or coming closer home, the battle of Molino del Rey.

It is also a recognized fact that railroads are of more assistance to the defensive than to the offensive, after the first mobilization and concentration (HAMLEY's "Operations of War," page 48), so that conceding this fact and considering the favorable direction of the railroads for the Mexicans in what would become the theater of war, we can only conclude that the building of railroads in Mexico has increased to a wonderful extent the defensive possibilities of that country, and, on the other hand, would prove of comparatively little assistance to the invader.

Another piece of nonsense often quoted and firmly believed during the excitement arising from the "CUTTING affair," was that the border States, meaning in this instance, Texas, New Mexico and Arizona, if let alone, could defeat Mexico and overrun the country, themselves; and this because the gallant and hardy frontiersmen would volunteer in such numbers, and be possessed of such innate fighting ability that the Mexicans would be seized with a panic at the sight of them. I admit that there is some very fine material among such volunteers, but in their haste to get at the enemy, some very important preliminaries would be neglected, such as discipline and proper training in the methods of modern warfare, and the result would certainly be disastrous.

In event of war with Mexico, these volunteers would, no doubt, come forward in reasonably large numbers—nothing like what we might be led to expect however. Once enlisted and made into organized bodies—with no training and less discipline—I very seriously question their fighting abilities, and also their liability of remaining with the flag when once exposed to hardships and privations. One thing is certain, the American leaders in our other war with Mexico in 1847, had an experience with these "border volunteers" that is far from encouraging.

During the war, Texas was undoubtedly more interested in a successful issue on the part of the United States forces than any other State in the Union; and it was reasonable to expect that she would furnish her best men and exert her greatest efforts to assist General TAYLOR. While Texas was the theater of operations, these volunteers did passably well, but after the advance to Monterey, we find the brigade commanders making such complaints of the excesses and insubordinate acts of the Texas troops, that in one communica-

tion to the War Department, General TAYLOR writes, "I am forced to request that no more troops may be sent to this column from the State of Texas," and further on in his "rough and ready" style condemns them as "utterly worthless." The troops from Arkansas, then a frontier State, are not spared either. So, taking into consideration the fact that these gallant and hardy frontiersmen (?) acted in this inefficient manner when so much was at stake in 1847, we could hardly expect any better service from the same class in any war that might arise now or in the future. We may therefore conclude that the support from that source would be extremely unreliable, and that the Government would find the numbers and gallantry of the men greatly overestimated. So our strength might *not* be so great as we had been led to expect.

Another point to be borne in mind is that Mexico has not yet attained such a status as a Republican Government that the legislative assembly *might* not be dispensed with, and a Dictator declared, if the occasion demanded, and to have affairs very much centralized or controlled entirely by one man, is an undoubted advantage in war, however destructive it may be to the liberties of the people. During our late war Congress and politics very often interfered to ruin some of the best laid plans of the generals, and in the war with Mexico there was so much party spirit that the statement has been boldly made that it was intended that General SCOTT should be unsuccessful on his line of operations. So that in case of war with Mexico we could not safely count upon all our great resources being available, from the fact that a large proportion of our people might not, probably would not, be in favor of it, *whatever* might be the cause.

As stated in the outset, and now I reiterate it with great emphasis, I have not for one moment *attempted* to convey the idea that Mexico could *ultimately* defeat us in case war occurred, but my intention throughout has been to combat some of the popular fallacies concerning Mexico and her military resources, that have been rampant so long that they are actually accepted as axioms by great numbers of sensible people, who have not investigated the matter, and who are not aware of the great strides that our neighbor has taken in wealth, intelligence and power within the last few years. If we should go to war believing such nonsense as that she is poor and unprepared, and that one American is the equal in battle of three Mexicans, the defeats that we would sustain would give knowledge that might be acquired beforehand with very much less loss and humiliation. In fact, if war ever comes, let us never set foot on

Mexican soil with less than 200,000 men, ready to march, and above all, let no army of 50,000 men leave the United States with any expectation of contributing anything except defeat and disaster towards the general result. And when, after thorough preparation and consideration of the problem presented, our armies advance, let us expect to meet a foe well organized and prepared to fight with desperate bravery for his native land.

In preparing this paper the writer has consulted the following named authorities:

"The Other Side, or a Mexican History of the War in Mexico." (RAMSEY.)
"War With Mexico Reviewed." (LIVERMORE.)
"Review of the Mexican War." (JAY.)
"History of the Mexican War." (JENKINS.)
"The Mexican War." (MANSFIELD.)
"Appleton's Guide to Mexico." (CONKLIN.)
Railroad folders and pamphlets issued by the Mexican Central and Mexican National Railways.

I also feel myself very much indebted to the Bureau of Information, War Department, at Washington, Major JACOB KLINE, Twenty-fourth Infantry, and First Lieutenant A. L. WAGNER, Sixth Infantry, for information furnished.

THE TROOP IN THE FIELD—EQUIPMENT.

By Captain CHARLES E. NORDSTROM, Tenth Cavalry.

THE efficiency of the troop in the field, depends on the condition of the horses—assumed to be first-rate—the knowledge of the officer in command as to the best means to be employed whereby this condition will be conserved, and the success which attends his constant and untiring efforts, in seeing that the men make a proper application of the instruction which has been imparted to them. In striving to accomplish these desiderata, there are almost as many methods as officers.

While it is, of course, impossible to lay down rules which will govern in all circumstances, it ought, nevertheless, to be practicable to prescribe certain general regulations, applicable to situations of a like character; and the object of this paper will be an effort to formulate rules of action, by following which, the younger and less experienced officer may avoid the commission of those mistakes, which so largely make up the experience by which we learn. Our purpose will be best accomplished by (1) a concise enumeration of the general rules to be observed, and (2) such comments and elaboration as a consideration of their application seems to demand.

GENERAL RULES.

1. *Column or Route.*—On roads by twos, on trails or across country, by file.

2. *Gait.*—The habitual gait of the ordinary march is the walk, the rate four miles an hour.

3. Where it becomes necessary to go faster than a walk, the alternate walk and trot are used—forty minutes at the walk, twenty minutes at the trot.

4. *The gallop* should never be used in ordinary marches.

5. *Halts.*—In an ordinary march of twenty-five miles, there should be five regular halts.

6. *At every halt*, the saddle should be examined, and if any have slipped, adjusted.

7. *Grazing.*—When the halt exceeds three minutes the bridles should be slipped, and the horses allowed to graze.

8. *Watering.*—En route, water as frequently as possible, or as often as the horses will drink; if in a stream, and time will permit, water in column; otherwise in line.

9. *Leading.*—Unless the weather is cold, and the men are suffering, never lead.

10. Slacken the pace when its continuance would cause any portion of the column to trot to close up.

11. If a trooper for any cause (sickness excepted), is compelled to leave the column, he should do so alone; it is better that one horse should "fret" and become tired in catching up, than two.

12. When Indian scouts are sent away from the column, they should be accompanied by men from the troop.

13. *Grooming.*—"Grooming should be done on the march, only in the evening, and as late as possible."*

14. Two shoes and eighteen nails should be carried in the saddle-bags.

15. In summer the troop should be in the saddle by 7 o'clock; in the winter, an hour later.

In continental countries, where the marching is done on turnpikes, and other highways of like broad dimensions, the column of route may be anything from a file to the front of a platoon; but with us, owing to the narrowness of the roads, and often to the absence of any road at all, it is confined within very narrow limits. It has been stated as a "general rule" that it will be by twos, or by file, according as the column traverses the road, trails or prairie; but in such a country as we find in Arizona and New Mexico, where the topographical features consist in good part of high mountains, ravines of various depths, and almost bottomless cañons, we are not sure but that it would be better to prescribe that the "scouting column" should invariably go by file. And, indeed, we know of but very few roads in either of these Territories where troops marching by twos, will not occasionally jostle each other, to the great detriment of the tired horses, and of the symmetry of the canteen and tin cup; and when to this we add the social inclinations of this formation, which talks and laughs and becomes careless of the reins and seat, we have a strong argument in favor of the column by file, where the trooper by reason of his partial isolation, is liable to pay more attention to riding

*Colonel GUY V. HENRY, Ninth Cavalry. CAVALRY JOURNAL, No. 5, p. 167.

and the movements of the horse. To see that the men constantly feel lightly the horse's mouth, and do not "loll" in the saddle, should engage the attention of every officer and non-commissioned officer in the command. "Eternal vigilance is the price of" unbroken knees and sound backs.

In a close country, or where there is the remotest reason to apprehend a surprise, it is recommended that the columns of files be divided into groups, varying in strength of, say from three to fifteen men, with appropriate distance between groups, the distances between the files of the first and second groups to be increased to ten yards or more according to circumstances. Say the troop consists of forty files, the groups would be disposed about as follows, subject of course to any change dictated by special conditions:

First group.—Three men, distance between files, ten yards.
Second group.—Five men, distance between files, ten yards.
Third group.—Seven men, closed to tactical distance.
Fourth group.—Nine men, closed to tactical distance.
Fifth group.—Twelve men, closed to tactical distance.

Leaving two men for point and two for flankers, the former being from 125 to 150 yards in advance of the first group. The distances between groups from front to rear should be 50, 75, 100 and 150 yards respectively. Where Indian scouts are present for duty, they should be sent in advance, accompanied by one of the scouts from the troop, the other joining the rear group, or perhaps, placed as a connecting file between the scouts and first group. These dispositions, in themselves powerful incentives to vigilance, increase the mobility of the column, and will, it is thought, render surprise almost impossible.

The stations of the non-commissioned officers have not been considered, for the reason that their number is rarely ever constant, but as a rule there should be at least one with each group. It may be considered supererogatory to state in terms that the Indian scouts should go in advance, but an instance in the GERONIMO campaign, where the failure to observe this very ordinary precaution resulted in the loss of an officer and five men killed, seemed to demand a repetition of the truism. One of our most progressive cavalry officers* has said, "A detachment commander should always be able to satisfactorily answer these questions: What would I do with this command if I should see the enemy over yonder, or on that hill? What would I do with this command if I were attacked this moment?" The corollary of which is that any officer who, having the slightest suspicion that he is in the neighborhood of hostile In-

*Captain H. E. WOOD, Fourth Cavalry. CAVALRY JOURNAL, No. 5, p. 165.

dians, suffers his command to be surprised, should be dismissed the service.

In concluding this part of our subject, it is proper to remark that the dispositions of the "scouting column" do not follow the rules laid down in the books, these applying to civilized warfare, which is radically different from Indian fighting.

On roads, or across a level or undulating country, the troop will march twenty-five miles in six and three-quarter hours, and the time occupied in excess of this is a positive detriment to both man and horse.

Within the last two or three years much has been said, and more written, concerning the gait which should be observed in conducting an ordinary march of this distance, some advocating the alternate walk and trot; others holding that the gallop for short distances, in addition to the trot, would be beneficial; and still others maintaining that the column should be led occasionally. But we unhesitatingly pin our faith to the square, "flat-footed" walk of four miles an hour as being the least calculated to unduly fatigue the horse; this was the habitual gait of the war, when the cavalry on both sides performed feats which marked an epoch in the history of our arm, and this must necessarily be the gait with us, so long as our work is found in a country boasting few roads, and where trails, when they *are* discovered, traverse the almost inaccessible peaks of high mountains.

Following the example of that incomparable cavalryman, General PHILIP ST. GEORGE COOKE, whose long and rapid marches, furnished many brilliant proofs of the endurance and celerity of American cavalry, we abandon the trooper to the ingenuity of his own devices, considering only the horse, and the means whereby he can do this work in the easiest manner.

We take it to be a question of the expenditure of energy, pure and simple. Fatigue results from effort; the more violent the effort, the greater the fatigue. Now if it can be shown that the horse carries his load with less effort—with a less expenditure of vital force, at the walk than at the trot, the former, of course, will be the gait to adopt. "French authorities tell us that a good sumpter horse, working on a *good* road, can carry two hundred and ten and one-half pounds *at a walk*, to a distance of twenty-four and eight-tenths miles in ten hours; but if the same horse be required to do his work at a trot, the burden must be reduced to one hundred and seventy-six and one-half pounds, in order to enable it to do twenty-two and one-third to twenty-four and eight-tenths miles in a day of ten hours.

If the burden consists of a rider with his saddle, etc., instead of inert matter alone, the horse can do twenty-four and eight-tenths miles *at a walk* on a *good* road, under the greater load of one hundred and ninety-eight and a half pounds, and he will only require seven to eight hours."* Now this is not unsupported statement, but the result of actual experiment, and from it several things pertinent to our inquiry are made apparent: First, that the horse expends a greater amount of vital energy at the trot than at the walk, and consequently does his work with less fatigue at the latter gait; second, that the horse can carry a greater load at the walk, and go further than at the trot, and third, that in order to travel the same distance at the trot as at the walk, the weight must be reduced.

The weight carried by our cavalry to-day is:

Saddle complete, including surcingle and crupper	19 lbs.	11	ozs.
Saddle bags	3 "	15	"
Saddle blanket	3 "	14	"
Curb bridle and link	3 "	01	"
Watering bridle	1 "	02	"
Halter and strap	1 "	15	"
Lariat and picket pin	3 "	01	"
Side line	1 "	09	"
Nose bag	1 "	02	"
Horse brush	0 "	10	"
Curry comb	0 "	13	"
Carbine	8 "	00	"
Pistol	2 "	07.5	"
Carbine sling and swivel	1 "	00.5	"
Saber and knot	3 "	10.5	"
Saber attachment	0 "	08	"
Pistol holster	0 "	10	"
Cartridge belt with 45 cartridges	4 "	11	"
Canteen and strap	1 "	02	"
Meat can	1 "	00	"
Tin cup, knife, fork and spoon	0 "	14.5	"
Two shoes, sixteen nails	2 "	02.5	"
Overcoat	6 "	02	"
Change of clothing	7 "	04	"
Bed blanket	5 "	01	"
Twelve pistol cartridges	0 "	10.5	"
Shelter tent	1 "	12	"
Total	87 lbs.	13.5	ozs.
Add to this the weight of the trooper	160† "		
And we have a total of	247 lbs.	13.5	ozs.

carried by the horse—the least possible burden he is allowed to carry under existing orders. It will be seen that these figures do not include the weight of the rations, the extra ammunition, nor a feed for the horse, which it is occasionally necessary for the trooper to carry.

*Migout et Bergery. "Theorie des Affûtes et des Voitures d' Artillerie," quoted in "Seats and Saddles," pp. 93 and 94.

†The average weight of the writer's troop.

Now, if it requires from "seven to eight hours for the horse to carry 198 pounds twenty-four and eight-tenths miles *at a walk* over a *good* road," how long should it take him to carry 247 pounds over a country where there are *no* roads, and how much of the pack should we abandon if we trot, say twenty minutes in the hour? Leaving the solution of these problems to those gentlemen who claim that the trot "eases" the horse, we proceed to further illustration in support of our position.

Ordinarily, when the infantry column has marched fifty minutes it is halted for rest, which is taken either sitting or lying, according to the degree of fatigue experienced by the individual. What, can you imagine, would be the feelings of that individual if the commanding officer were to come along and say, "SMITH, you are pretty tired I know, but we will 'ease' you pretty soon with a little *double time*." Let us suppose that in addition to the dead weight of his pack, the soldier, being a married man, with children, is compelled to transport one of them astride his knapsack, and thus harnessed seeks rest and "ease" in the double time for a quarter of a mile or so, will not every step he takes at the increased pace cause the added burden to bob up and down, and will not the downward movement when arrested by the knapsack, communicate a shock to the bearer which would not be felt at the ordinary pace? Ask him. Possibly some one may say this is a *reductio ad absurdum*, but it aptly illustrates precisely what happens when the horse with a man on his back takes the trot—the downward movement of the rider when stopped by the saddle, communicating a shock requiring increased effort to support.

This question should also be looked at from another point of view, which is, that every horse in the column should do the same amount of work and no more—a desideratum seldom realized even at the walk, where there are always some horses near the rear of the column found "jogging" occasionally in order to keep up; these of course do more work than those who are able to sustain the walk, and when to this is added the "tetering" and jumping of the fretful, fractious brute, who evidently thinks that every increase of movement is the signal for a race, and attempts to act accordingly, it is seen that if the strength of the horse is to be conserved, the less trotting done the better. The "jogging" at the rear of the column arises in some instances from the natural inability of individuals to walk as fast as their fellows, but in the majority of cases we fear it is the result of careless riding, and failure to keep closed to the prescribed distance—faults only to be remedied by more attention to "gaits," and the eternal watchfulness of the officers.

Halts.—During the march there should be at least five halts: one of fifteen minutes at the end of the first hour; one of five minutes, thirty minutes later, and the other three of five minutes each, distributed as required in the next five hours and a quarter; the next halt should be in camp. These halts are not made to rest either horse or man, both being able to make a march such as we are describing without fatigue, or at least such degree of fatigue as requires cessation of effort, but they are made rather that measures may be taken to avoid other halts. During the first halt, and in fact, every halt, the saddles should be examined, and if needed, adjusted, two men being required for this purpose, one on each side of the horse to lift the saddle and blanket entirely clear of the back, that the hair may not be rumpled—a more fruitful source of sore backs than many suppose. This is the "straightening-out-halt,"* and those men who have not already done so should be required to go to the rear, and otherwise get ready for the march before them. Soldiers are proverbially careless of themselves in this matter, and need looking after.

At the first halt most of the horses, if the camp was at water the night before, will have urinated, but not all of them, and the halt thirty minutes later is made for the accommodation of these animals, and incidentally, another glance at the saddles, which, with our present means of saddling, need constant looking after. Major BERNARD lays down the rule that at the second and succeeding halts the girths should be loosened and the horse's back examined, the saddle, when replaced, to be put about an inch in rear of the place it occupied in the morning. We are sorry we cannot agree with him in this. There can be but one *proper* place for the saddle, and if the back is sound and the saddle fits it, and is seen to be in its place, the less it is adjusted the better. In very hot weather when it has been found necessary to cinch tightly to keep the saddle where it ought to be, it will, perhaps, be advantageous to occasionally lift the saddle blanket and allow the air to pass over the fevered surface of the back, but as has just been said, unless the saddle or blanket has slipped, they should remain untouched. "More backs are made sore from resaddling on the road than many are aware of."†

Leading.—Unless the men are suffering from cold, or in cases of traveling up and down steep hills, we enter our emphatic protest against the custom followed by some (their number is gradually growing less every day), of "leading out briskly," as it is termed,

*CAVALRY JOURNAL, No. 5, page 158.

†Major ADNA R. CHAFFEE, Ninth Cavalry, CAVALRY JOURNAL, No. 5, page 170.

at regular intervals, or, in fact, at any interval at all; it does not rest the horses, because they are not fatigued; but it does tire the men, and keeps the command on the road under the saddle long after it should be in camp, enjoying the rest that counts. "Leading out briskly" will always be found in appropriate companionship with "March an hour; rest ten minutes"—some went so far as to say fifteen—customs inherited from *ante-bellum* times, when the orthodox cavalry march was from "fifteen to eighteen miles *a day*" literally, as it took *all* day to do the distance. The disgusted trooper, who characterized this mode of marching as "starving the horses to death on the road," knew what he was talking about. For many weary years, during which our devotional exercises were limited to a fervent utterance of the prayer, "Oh, Lord! how long?" we were compelled, in agony of mind, and anguish of body, to follow these customs—or rather, to follow those who followed them, and the bitter experiences gathered from those lustrums of "masterly inactivity," those cycles of "how not to do it," entitle us to speak feelingly, and—but we forbear; no weak words of ours can do the subject justice.

Grazing.—We once heard an old officer—new, however, to the cavalry—say, "Grass is a good condiment for horses," and although the expression caused many "audible smiles," and finally became a by-word in the regiment, a little examination shows it is not far from the truth. If hay and grain are fed, a little grass promotes digestion; and in cases (fortunately growing rarer every day) where the command depends altogether on grass, it cannot have too much of it. No opportunity, therefore, should be neglected to allow the horses to graze.

Watering.—It is only within comparatively recent years that we have awakened to the importance of being able to furnish horses good, pure water. Formerly any duck pond or mud hole, the waters of which, contaminated by the presence of decaying vegetable and perhaps animal matter, abounding in the germs of disease, was considered good enough for the dumb beast to slake his thirst in; but, thanks to scientific investigation, with which the veterinary art has kept pace, we now take as much thought of what the horse shall drink as of what he shall eat. The importance of this subject cannot be too strongly impressed, and we quote, without apology, an extract from what is said on it by that eminent veterinary surgeon, Dr. C. B. MICHENER, in his article on the "Diseases of the Digestive Organs," published in that most valuable contribution to equine literature recently issued by the Department of Agriculture, entitled

a "Special Report on the Diseases of the Horse." Dr. MICHENER says: "It is generally held, at least in practice, that any water that stock can be induced to drink is sufficiently pure for their use. This practice occasions losses that would startle us if statistics were at hand. Water that is impure from the presence of decomposing organic matter, such as is found in wells and ponds in close proximity to manure heaps and cess-pools, is frequently the cause of diarrhœa, dysentery, and many other diseases of stock, while water that is impregnated with different poisons and contaminated with specific media of contagion, produces death in very many instances."

We are frequently obliged to water in all sorts of places, varying from the spring impregnated with many of the salts known to *materia medica*, to the "water hole," wherein the beasts of the field, the birds of the air, have wallowed and sometimes died; but when good water *can* be had, it should be our effort to see that it comes to the horse clear and pure as it flows; this cannot be the case when the command waters in line, where the horse on the up-stream-flank is the only one who gets a clean drink, all the others, depending upon their location, drinking more or less mud in suspension. In large commands, and particularly where time is a factor in the march to be considered, watering in line cannot always be avoided; but with the single troop, or smaller detachment, it is practicable, in streams at any rate, to water in column; and if the column be by file as recommended, each horse drinks the water clear and pure as it comes to him, "unriled" by the restless pawing of his neighbor.

Neither in the regulations, UPTON'S tactics, nor any of the articles on "Marching and Camping Cavalry," published in the various service journals, have we been able to find a rule governing the *time* of watering in connection with feeding. The importance of this matter has been overlooked; it should be considered with reference to the circumstances of the particular case. In camp it is almost always the custom to water after feeding, just before commencing the march, which in the majority of instances, is the reverse of what ought to take place. If water is going to be scarce during the day, or a dry camp is to be made, then it will be apparent that drink will be more beneficial than food, and watering after feeding indicated, as the horses will drink more then than before; but on the other hand, if water will be plentiful en route, the greater importance of food will be suggested, and the horses watered before they are fed, which will avoid a portion of the grain being swept into the intestines along with the water, before it has been subjected to the action of the stomach. Food thus prematurely carried out of the stomach,

escapes the influences of the gastric juices, is consequently not properly prepared for intestinal digestion, and is evacuated in nearly the same shape as when it left the grinders, its nutritive properties being, of course, almost wholly lost.

The order in which hay and grain should be given also demands attention. Many of us think that, so long as the horse gets his full ration of both, it makes no difference which he eats first, hay or grain; but it really does make a great difference. "The length of time occupied by the stomach digestion varies with the different foods. Hay and straw pass out of the stomach more rapidly than grain. It would seem to follow then that grain should be given after hay, for if reversed the hay would cause the grain to be sent onward into the intestines before being fully acted upon by the stomach, and as a result produce indigestion. Experience confirms this. There is another good reason why hay should be given first, particularly if the horse is very hungry, or exhausted from overwork, namely: it requires more time in mastication (insuring proper admixture of saliva), and cannot be bolted as are the grains. (MICHENER.)

This would seem to be a proper place to briefly discuss the preparation which the food should undergo, before it is given to the horse.

If we examine the droppings in any cavalry stable, or on any of our picket lines, it will be found that some of the food passes through the horse, presenting no evidence whatever of having been acted upon in the digestive tract, or even by the grinders, the grains being intact. This is all wrong and should be corrected, and would be if the course recommended by all writers on the subject were followed, viz: that the grain whatever it be, corn, oats or barley, should be crushed before being fed, thereby facilitating digestion, and securing increased development of its nutritive properties. Every cavalry officer who has given the subject any thought, recognizes its importance, and it has time and again been urged upon the authorities, but without avail; we still go on purchasing the orthodox "twelve pounds per day," and feeding it as it comes from the threshing machine.

There should be at every post means furnished to crush the grain, and this again should be soaked from six to twelve hours—depending on the time of year—before it is put before the animal for his consumption. The first cost of the mills, would, of course, amount to something, which is not improbably the reason they are not forthcoming, but this is short-sighted policy, as three fourths of the present

ration, properly prepared, would prove ample, and the savings thus made not only pay for them in a very short time, but result in decreased appropriations for "regular supplies" in the future.

Slackening the gait at hills, is a custom which should be carefully observed. There, however, the "scouting column" is divided as recommended; the distance between the groups will render the observance unnecessary in most instances, but when the precautions which dictate this division are not suggested, and the column is closed, the pace on "raising a hill" should continue to be the same as the ascent, until all are up, a fact to be announced by note on the trumpet at the rear of the column. In this way the pace is uniform; there is no "tailing out," as Captain Wood calls it, and each horse does the same amount of work.

Our present means of saddling being almost entirely devoid of anything *really* qualified to keep the saddle in place, much time is lost walking up and down hills which, but for the fear ever present, of sore backs, would not occasion any dismounting. On the ordinary march, such as we are considering, these delays are of no special importance, except as they postpone the arrival in camp; but on marches where time enters into the calculations, they may become of serious moment. There exists great diversity of practice with respect to leading; we have known officers to dismount at every little acclivity, and others to race up the steepest hills. The matter calls for regulation and some well digested rule should be laid down prescribing generally of course, the angle of ground at which it is necessary to dismount. The new drill regulations say, "Cavalry cannot effectively preserve formation in charging *down hill* if the incline be greater than five degrees; it can canter (eight miles an hour) down hill, and charge *up hill* and preserve formation, if the incline be not greater than ten degrees." This, though of immense value in its place, does not aid us, even analogously, in determining when the horse should be relieved of the burden of his rider. It may be said that the matter can be safely left to the common sense and judgment of the commanding officer; but common sense is oftentimes very uncommon, coming only with experience, and the "youngster" with neither, who is frequently sent on a scout alone, should find some rule for his guidance in the premises.

The Transportation of Horse Shoes.—It is with some diffidence that we have announced the rule with reference to carrying shoes and nails in the saddle bags. Many of our best officers, notably the present able Inspector of the Department, disapprove of the practice, but if the exigencies of the march are to be considered, it is not seen how

it can be avoided. The shoes to be of service, must of course, be fitted to the foot for which they are intended, and if carried on mules, they are certain to become inextricably mixed up; and when a horse casts a shoe the whole lot will have to be gone through in the tentative effort to get the one belonging to him. Besides this, much detached service, such as courier duty, etc., is performed without pack mules, when the shoes have to be carried by the trooper. Horse shoes are as necessary as ammunition; and until horses are born with feet which will successfully resist the ravages of rock and gravel, or until we are furnished animals with hoofs *sufficiently* "hardened" by the new process, so eloquently advocated by gentlemen of the artillery, to withstand these agents of destruction, shoes must continue to be used, and we fear, added to the burden the cavalry horse is doomed to carry.

Camp.—At the end of the march the command is immediately unsaddled, and each trooper ascertains the condition of his horse's back by actual examination, the hand in its passage over the back aiding the eye; if any rubs or warbles are discovered the back should be bathed in cold water, the warbles being "showered" until all evidences of inflammation have disappeared; if the swelling proves intractable measures should be taken to relieve the pressure on the parts when next the horse is saddled. But of this later. In cool weather, until the horse has rolled, for which purpose smooth ground, clear of stones and cactus thorns should be selected, and in hot weather, until the back has become dry, the folded blanket secured by the surcingle, should remain on the back. This precaution should never be neglected, as the back is in what may be termed a "parboiled" condition, and much more liable to be abraded in rolling, or blistered by the hot sun than after it has become dry. Before the horse is turned loose to graze the feet are examined, clenches driven up, if needed, and missing shoes replaced.

Grooming.—Grooming should take place in the evening while the horses are eating their grain. Stables should invariably be attended by the commanding officer, who, accompanied by the farrier, carefully examines the condition of each horse, and prescribes remedies for whatever damage has been done during the day. The consequences of any lesion found to be the result of careless saddling, being inexorably visited on the trooper responsible. It is surprising what an incentive to careful saddling a ten mile walk proves to be.

Indian Scouts.—At the posts in Arizona and New Mexico, Indian scouts are furnished to accompany scouting parties as trailers. When these are detached from the column, they should invariably be accom-

panied by soldiers whose presence will assure their pacific character, and guard against their being fired upon by the inhabitants of the country.

We have now completed the consideration of the incidents of the first day's march from the post, and it but remains to briefly notice the events of the next morning, to conclude this portion of our subject. These events and their sequence will be:

Reveille, *good* daylight, the cooks having been awakened an hour earlier.

Water Call.

Stables.

Breakfast.

Boots and Saddles.

It was the custom formerly, to have the command in the saddle and on the road at daylight; and under the system of marching in vogue in those days, the start thus early was necessary, if it was intended to get anywhere during the day; but thanks to more experienced counsels, these antiquated ideas are fast losing their exponents, and now, no one, unless he be a confirmed "moss-back," hopelessly joined to his idols, ever thinks of commencing a march in summer, earlier than 7 o'clock, or an hour later in the winter time. The horse does his sleeping between 2 o'clock and daylight; if disturbed during this period, he is listless and logy for the rest of the day, and ill qualified to perform the work required of him. Lack of sleep saps the strength quicker and more effectively than any other hardship, not even excepting hunger itself, to which the horse can be subjected; and it is simply nothing short of cruelty to deprive him of the requisite modicum of "tired Nature's sweet restorer," if it can be avoided. The utmost quiet then, should prevail in camp, the guard and the cooks, who are afoot before daylight, performing their duties as silently as possible.

At stables, grooming will be dispensed with, that ceremony being confined to brushing the back off just before saddling; the men after feeding the horses, leave the picket line in charge of the guard, and get their packs ready to be strapped to the saddle—*after* saddling, never before—and the packers get everything in train to pack the mules.

In taking leave of this division of our theme, we desire to be indulged in a few words, iconoclastic perhaps, concerning that veritable *bête noir* of the service, *Morning Stables.* Grooming the horse is analogous to the bath which every well regulated person takes at appropriate intervals; for purposes of cleanliness, the ob-

ject of grooming, no one ever thinks of taking more than one a day, and the horse should certainly be satisfied with what is sufficient for the man. Morning Stables, which, in winter, takes place before sunrise, are the fruitful source of more colds, coughs and cases of pneumonia, than result from all other causes combined, guard duty, perhaps, excepted. The custom, like many others, (from which we are gradually becoming divorced), encrusted in the rusts of old fogyism, is a relic of the past, an anachronism which finds its only excuse for existence, in respect for that tyrannical old bugbear, precedent; the welfare of the horse does not require it; the health of the men and the sentiment of the service are arrayed against it, and it should be formally abolished.

EQUIPMENT.

The McClellan saddle has been in use for thirty-four years, and notwithstanding efforts have, from time to time, been made to supplant it, it still maintains the just reputation of being the best cavalry saddle in the world to-day. Our discussion under this head will therefore be confined to a consideration of its proper place on the horse's back, and the means furnished by the equipment to keep it there.

The new drill regulations say, "*Place the center of the saddle in the middle of the horse's back,*" but the new drill regulations leave us in the dark as to *where* the middle of the back is; turning, however, to the late Major DWYER, the distinguished author of that most valuable work, "Seats and Saddles, Bits and Bitting," we find it located at the fourteenth dorsal vertebra, which, he tells us, is the center of motion. We take it for granted that this is true, but let us examine a little and see if the expression used is the best one to describe to the recruit the proper place for the saddle. If gravity, motion and figure were co-incident, the three finding their centers at the fourteenth vertebra, then the manifest advantage of placing the saddle there would justify an anatomical exploration for that particular spinal process (let some inquiring cavalryman try to find it in a fat horse), but as an examination of the frame-work of the horse shows that the fourteenth vertebra, though probably the center of motion, is never either the center of gravity or the center of figure—whether these be considered in relation to the whole length of the horse or only his back—the term "in the middle of the back," is seen to be misleading, and may, if followed, result in the saddle being placed where it ought not to be; for example, a man who reckoned from the top of the withers, just over the fifth vertebra, to

the hip, would locate "the middle of the back" in an entirely different place from the one who started in his calculations from the hollow in rear of the shoulder blades. "The middle of the back" is then by no means an exact expression, and should be replaced by something incapable of perpetuating error—something in fact susceptible of absolute demonstration. Fortunately we have not far to go to obtain all that is necessary: *Place the saddle on the back so that there will be three fingers' width between the ends of the front bars and the rear of the shoulder blades.* Can anything be more simple than this? Can anything be more exact?

To be sure, the anatomical lore, which it enables us to display, is limited to a knowledge which comes at a glance, or in the dark by the sense of touching the situation of the shoulder blades; there is no *guessing* at the position of the fourteenth vertebra, nor any speculation as to the locality of the "center of motion," but its practice will enable us to put the saddle where it belongs; where it will do the least harm, and this, we take it, is the main object to be achieved. This method of placing the saddle goes so far back "that the memory of man runneth not to the contrary," and has always given satisfaction. But we have been searching after strange gods lately—and found them.

In connection with this subject, we have been at the pains of making some experiments. An eleven and one-half inch saddle was applied to the backs of twenty horses in the writer's troop; it was found that when the ovals of the front bars fitted into the hollows behind the shoulder blades, the width of three fingers being allowed for their play, the center of the saddle, which had been carefully ascertained, was in almost every instance exactly over the fourteenth vertebra, *but in no instance was the saddle "in the middle of the back."*

Having ascertained the proper place for the saddle, our next task is to inquire what means are at our command to keep it there, and if these are inadequate, to point out what additional means are required to accomplish the desired end. The saddle in place is acted upon by four different forces, or rather by force, acting in four different directions, viz: two longitudinally, from front to rear and from rear to front, and two laterally, from right to left and from left to right. Bearing in mind that the saddle is composed of two pieces of inflexible wood, bound together by still more inflexible iron; that its under surface is fashioned in a convex shape to accurately fit a concave shape, and that unless these accurate relations between the two are constantly maintained, sore back is bound to result; it would seem reasonable to suppose that the adjuncts of correct sad-

dling would include agents designed to neutralize the effect of any force calculated to upset these essential relations, but the fact is, our equipment embraces nothing of the kind, being limited solely to the girth, which, unless it be drawn so tightly as to seriously impede respiration, acts only laterally, and the longitudinal force is left practically untrammeled, to wander at will over the back, to make holes in it. The girth has one legitimate office, and only one, that of preventing the saddle from turning, and the moment we invest it with other functions, trouble infallibly ensues. If the frame of the horse were a cylinder, and if our scouting were done on level ground, then the friction of the girth would be ample to keep the saddle in place, as there would be no longitudinal motion to overcome; but unfortunately for the wisdom that has deprived us of nearly everything needed to a proper adjustment of the saddle, the horse is not built this way, but on the order of curves, and irregular curves at that, and a good deal of his work comprehends climbing up and stumbling down mountains, where nearly all the motion of the saddle is in a longitudinal direction.

Where the horse has what is termed a good "barrel," the girth, if drawn *very tightly*, may keep the saddle approximately in place for a short time; but tight girthing prevents the expansion of the lungs, limits the operation of breathing, and cannot but be painful and injurious. Good "barrels," too, are things decidedly evanescent; under the conditions of field service, they have a disagreeable habit of disappearing, when the form of the horse, losing that sleek, unctuous rotundity, so dear to the eye of the "tight girther," assumes more or less the proportions of the grey-hound. When this stage is reached — and it is not long in coming — the back, as well as the belly, shrinks, the rear ribs assert themselves and become prominent, the girth, having nothing to stop it, slips to the rear, carrying the saddle with it, two convex surfaces come together, and as the one *can't* yield the other *must*, and what do we have? Holes in the back, of course; and the tighter the girth the bigger the holes.

Again, many horses have "barrels" so large that the girth is found in front of the "swell," and no matter how tightly it may be drawn it gradually slips toward the fore legs, taking the saddle along with it, in which case we have bruised, perhaps fistulous withers, the ultimate result in the majority of instances being "I. C."

There is but one remedy for this state of things: the reinstatement of the breast-strap and the crupper, which are complemental of each other, the one preventing the saddle from slipping to the rear, the other hindering it from going to the front. In other words, their

use will effectually and completely serve to keep the saddle where it ought to be; all necessity of resaddling on the road will be obviated, and the girth, instead of cutting the horse in two will be left to the performance of its legitimate and only function—preventing the saddle from turning.

The Saddle Blanket.—When the horse commences to lose flesh and the back becomes thin, this does not interpose a sufficient barrier between the unyielding bars of the saddle and the back; it is not heavy enough and should be supplemented by a perforated felt saddle-pad. The cost of the pad would be comparatively little, and its adoption would not only save the horse's back, but placed next to it, it would keep the blanket clean, and cause it to wear much longer than it does now. The saddle-pad is not only a preventive but a palliative of sore backs. No matter how perfectly the saddle may fit in the first instance, no matter how much pains may be taken in saddling, in a campaign sore backs are bound to make their appearance sooner or later, and unless something be speedily done to arrest the cause, the horse soon becomes unserviceable and the trooper dismounted. The principle of the "corn cushion," as applied to the human toe, comes in here, and can be adapted to the sore back with perfect success. By cutting a hole in the saddle-pad large enough to receive the abraded surface all pressure on the sore is relieved, the horse does his work without pain, and the sore gets well under the saddle. Care should be taken that the hole in the pad is no larger than is necessary to fairly clear the abraded or bruised surface, else enough flesh may be crowded into the hole to cause the sore to project above the surface of the pad, bringing it in contact with the blanket, when the object to be secured, would in a measure, be defeated. The area of the back comprehended within the opening of the "cushion," may on unsaddling present a more or less "puffy" appearance, and create some distrust as to the efficacy of the treatment, for which, however, there will be no occasion; the swelling, if swelling it can be called, is not the swelling of inflammation, and will subside shortly after the saddle is removed. If the sore be of a bland character—by which is meant, if it has not proceeded to the inflammatory or suppurative stages, it is good practice to cover it with adhesive plaster, whereby it will be protected from dirt and sweat.

It is now nearly twenty years since we first adopted the principle of the "corn-cushion" to sores on the horse's back. During this time, horses that were unable to endure the bare saddle, have been put under riders and "cured up" on the road; and many abrasions and swellings, which would otherwise have become running sores,

have been rendered harmless. Add to the equipment, the breast strap, the crupper and the saddle pad, and sore backs may be reckoned among the things of the past.

The Reduction of the Pack.—Though not originally included in the design of this paper, the question, "How may the packs be reduced?" is of such transcendent importance, that any proposition having in view its solution, becomes pertinent at any time and in any place.

But first as to its distribution: Our "text book" on this subject ("Seats and Saddles," page 102,) says: "One of the great difficulties is about the pack. There is no use in putting the saddle in the middle of the back, and the stirrups and rider in the middle of the saddle, unless you at the same time distribute the weight of the pack equally before and behind the latter; the component parts of the dead weight must be accurately balanced against each other." This is the opinion of a man, who, in his day, was considered one of the most accomplished officers in Europe; one who by experience and thoughtful investigation, was perhaps better qualified to speak authoritatively on this subject, than any one who has ever put his views before the public. If we are not mistaken, "Seats and Saddles" was made a text-book about the time the tactical board was in session at Fort Leavenworth, yet the new drill regulations perpetuate the vicious system which puts practically everything behind the rider, nothing in front; the weight now carried on the cantle being nearly forty-one pounds, while the pommel supports but a little over six. "And this is equable distribution!"

As has been seen, the pack, exclusive of extra ammunition and rations, weighs eighty-seven pounds, thirteen and a half ounces, or in order not to be too nice, let us say eighty-eight pounds. By abolishing the lariat and picket-pin; by carrying the saber on the saddle; by curtailing the dimensions of the saddle-bags one-half, and making the side line a hobble, this weight can be reduced six pounds. If to realize such a small decrease as this, involved doing away with any necessary article of equipment, or of even any article concerning the utility of which opinion might be divided, we question if it would be prudent to advocate any change; but where we can relieve the burden of the horse, and get rid of useless lumber at the same time, it becomes a manifest duty to do so.

The lariat and picket-pin are relics of the past, and should have been relegated to their appropriate realm long years ago. We have never yet seen them prevent a stampede; but we *have* seen the picket-pin, "whizzing" through the air, assist in many of them.

Whoever saw a cow-boy, or an Indian use either, except the former to "rope" a horse or cow with. The articles now carried in the saddle-bags, are the curry comb and brush, the watering bridle, the meat can, and the knife, fork and spoon. These could all be easily contained in receptacles one-quarter the size of the present saddle-bags.

The principle of the side-lines is correct; the trouble has been in its application. As at present used the restraint which it imposes on the movements of the horse is in a direct line with the greatest energy he is capable of putting forth; all the strength of the fore and hind quarter, together with that produced by the powerful muscles of the loin, in fact all the tremendous energy which propels the horse in his powerful stride, is brought to bear on the chain, which soon breaks or is torn from the leglets, when away goes the animal, the side-line, which was designed to fetter his movements, striking him at every jump, and serving only to spur him on in his frightened course. This is no imaginary situation; we have had personal experience in many just such situations.

To the "side-wheeler" or pacer, that abomination in sight of all true cavalrymen, the side-line is practically no restraint; he gambols along almost as well with as without it, for he is built to go that way. (And we have seen many good square trotters converted into mighty poor pacers by being side-lined.)

The remedy for all this is the hobble, which is easily made by shortening the chain of the side-line to the swivel and the two links attached to the leglets. Buckle these below the front pasterns, or if preferred, between these and the knees, and it is simply impossible for the horse to get free, for the reason that all the strength of the fore quarter is as nothing to the resistance opposed by the chain when the legs are brought so closely together. In other words, there is no "purchase." Under the influence of fright the hobbled horse may try to stampede, and for the first hundred yards or so be able to get up quite a respectable pace, but owing to the extreme exertion which attends his efforts to run, fatigue soon dominates fear, and he gives it up as a bad job, and can be caught by a child. The thieving redskin, bent on "stampeding" the side-lined herd, knows that all he has to do is to go into it with a couple of whoops and a buffalo robe, and the horses do the rest—a simple case of "press the button;" hobbled, he sneaks into it and frees every horse before attempting to drive off the herd.

We first converted the side-line into a hobble while scouting from the head of the North Concho to the Staked Plains in Texas in the

spring of 1880; and although we have had many "scares" since then, we have yet to bemoan the loss of a single horse. How any man can use the side-line after seeing the Indian hobble his pony with a string passes our comprehension.

The Shoemaker bit is an instrument of refined torture, and an enduring monument to the truth of the familiar saying, "Fools rush in where angels fear to tread."

Major DWYER, in that portion of his work devoted to "Bits and Bitting"—a book which when first read came to us as a revelation, and which reveals something valuable every time we take it up, likens the bit to a lever of the second order, the branches being the power, the curb the fulcrum, the bars of the mouth representing the weight to be raised. He lays down the following as the dimensions of a bit constructed on correct principles:

Length of upper cheek or branch, one and three-quarter inches.

Length of lower cheek, twice that of the upper, or three and one-half inches.

Mouth piece, as long as the horse's mouth is wide, or to use his own words, "The first grand rule must be, therefore, to make the mouth-piece precisely so wide that when placed in the mouth it fills close the outer surface of the lips, without either pressing on these or being subject to be displaced laterally."

Width of port, exactly the width of the tongue channel.

Height of port, sufficient to admit of perfect freedom of the tongue.

Now let us see in what particular, *if any*, the Shoemaker bit follows these rules of construction:

First.—The length of the upper branch, or that portion of it with which we need concern ourselves is, measuring from the center of the curb-strap slot to the line of bearing or axis of the mouth-piece two inches, or nearly so; and although this excess of a quarter of an inch over what it should be would seem to be but a small matter, when we come to consider how the position and dimensions of the slot control the movements of the curb strap, it will appear an item of some importance.

Second.—The lower branch instead of sustaining the relation of two to one, is five and one-quarter inches in length, or an inch and three-quarters longer than it should be, and almost three times as long as the upper branch. To this dangerous excess of leverage can be traced the fractured and ulcerated jaws to be found in every troop.

Third.—The mouth-pieces are all made the same length, to fit, probably, a dozen different sized mouths.

Up to a comparatively recent period, the idea prevailed that the

severity or mildness of the bit depended upon the height of the port, and we will venture to say that this is still thought to be the case by every ninety-nine enlisted men in a hundred; but nothing could be farther from the truth, the port, except in some Mexican monstrosities, furnished with rings, wheels and other diabolical agencies of torture, being designed as a receptacle for the tongue only, or, as the Germans have it, to give "tongue freedom;" and in violation of all we have heretofore held on this subject, candor compels the statement that in our judgment, so long as the port does not bore into the roof of the mouth, the higher it is, the greater the "tongue freedom" will be and the less danger there will be of that organ receiving injury.

In connection with the height of the port, Major DWYER speaks of horses with "large, fleshy tongues," implying, as it would seem (we may construe him erroneously here), that there is a vacancy between the superior surface of the tongue and the roof of the mouth in some horses. This, we are convinced, is not the case. We have yet to see a case where the tongue did not take up the whole space between the upper and lower jaws. This space is considerable, averaging, in most horses, about an inch.

In all horses the tongue not only fills the "tongue channel" and the space between the upper and lower jaws, but its sides project over the lower jaw until they come in contact with the lips, and unless the port be large enough to contain it, there must be more or less pressure on and displacement of the tongue before the mouthpiece finds its place on the bars. In this fact we have the reason for the uneasiness displayed by the horse the moment a bit of any kind is put in his mouth; the tongue is imprisoned; there is something in the mouth that does not belong there; and it is not until the horse finds that this foreign body causes him no pain, but only a slight inconvenience, is he content to allow it to remain there without protest, but the moment he becomes conscious of any pressure, even the slightest, then the tongue commences to wriggle and squirm and to convert itself into all sorts of shapes in its struggles to become free; and as even the largest port is too small to contain its volume without constriction, the pain is increased as the pressure, and it stands to reason, therefore, that the smaller the port is the more pressure there is and the more pain there is.

Major DWYER has not touched on the shape of the port, which we have always thought is fashioned in entire disregard of the shape of the organ it is designed to contain, it being in the form of an arch with its crown up, while the tongue is shaped like an arch inverted.

The tongue, however, is a very elastic and compressible substance, capable, probably, of accommodating itself to almost any quarters large enough to receive its volume without pain, and this, it is presumed, is the reason our author is silent on the subject.

The port being constructed in the same plane as the bit, lies when the branches are vertical or in line with the mouth, flat upon the tongue, affording no "tongue freedom" whatever; but as this position only serves to compress the tongue slightly and without pain, "tongue freedom" is not needed; it is only when the pull comes on the reins and the branches of the bit move beyond the vertical line, that the tongue seeks relief from pressure and mounts up into the port, and as the maximum of "tongue freedom" is only realized when the port is at an angle of exactly ninety degrees with the line of the mouth, it would appear that the bits of to-day, no matter how high or how low the ports may be, are constructed on entirely erroneous principles, and defeat the end they seek to compass. We realize that this will be deemed a startling proposition, but before any one ridicules it we advise him to make some little investigation, keeping constantly in mind that the horse's tongue completely *fills* his mouth, and that *naturally* there is no room for anything else there.

As the bits are now made it is impossible to obtain the maximum amount of "tongue freedom" unless the curb be unhooked, in which case we practically abandon the control of the horse, "and would be better off with a simple snaffle."

The remedy, as we see it now, is to set the port at such an angle to the plane of the bit that when the curb is of the proper length and the approximately maximum pull is applied to the reins, the port will be perpendicular to the line of the mouth. The angle at which the port should be made can be easily ascertained. According to our authority the arc through which the lower branches of the bit proceed, when acted upon by the maximum pull of the reins, should not exceed thirty degrees, and therefore the angle of the port with the branches should be sixty degrees, or thereabouts, in order to obtain the maximum of "tongue freedom."

The Shoemaker bit is made in three sizes, these referring to the height of the port alone, its other dimensions being uniform for all. The height of the port is for No. 1, three-quarters of an inch; No. 2, one and five-sixteenths—probably meant for an inch and a quarter —and for No. 3, an inch and three-quarters.* The last dimension is, in our judgment, the only merit the bit possesses. While No. 2 may anwer for small horses, the port of No. 1 is not high enough to

*These are outside measurements; inside they are a quarter less.

afford any appreciable amount of "tongue freedom," and to it the writer traces many lacerated tongues now existing in his own troop. Only a few days ago we had occasion to examine the bitting of a horse who invariably ran away with his rider whenever the troop went faster than the regulation gallop, and found the tongue mangled and bleeding from being pinched between the curb and a No. 1 bit —the "lightest" made. Having no No. 3's at hand the No. 1 was replaced by an old McClellan bit with a port at least two inches high, and what do you suppose was the result? This: that although the horse is a bolter, with a mouth of iron, he became more tractable, more easily controlled, from the moment he felt the larger port in his mouth, and this was due to greater "tongue freedom," to less pressure, the consequence being less pain. Henceforth, so long as the Shoemaker bit is furnished, we shall require for none but No. 3's.

Possibly some one asks, "The space between the upper and lower jaws being only an inch, and the height of the port being an inch and three-quarters, what is to hinder it from striking and wounding the roof of the mouth?" The question is pertinent, but easily answered: 1st. As the port is now made, it must revolve forty degrees before it can even touch the roof of the mouth, and we have seen that it is only necessary that it should revolve thirty degrees. 2d. That in our judgment, too much stress has been laid on this "wounding of the horse's mouth," most of it existing only in theory —our own experience, so far as we are able to recall, furnishing not a single instance—but if there were any danger, the instinct to avoid pain, would come to the aid of the horse, and prompt him to drop the lower jaw far enough to prevent the upper from being injured.

Our investigations on this subject have included measuring the mouths of no less than fifty-one horses, with the following results: Three measured $4\frac{4}{16}$ inches wide; three, $4\frac{6}{16}$; eleven, $4\frac{8}{16}$; three, $4\frac{10}{16}$; ten, $4\frac{12}{16}$; one, $4\frac{11}{16}$; three, $4\frac{13}{16}$; four, $4\frac{14}{16}$; one, $4\frac{15}{16}$; seven, 5 inches; two, $5\frac{2}{16}$; one, $5\frac{3}{16}$; one, $5\frac{4}{16}$, and one, $5\frac{5}{16}$. And the mouth-piece of the Shoemaker bit which is $4\frac{14}{16}$ inches in length is supposed to *fit* all these mouths. What marvelous adaption! An examination of these figures shows that in thirty-four cases the mouth-piece was too long; in thirteen cases it proved to be too short, and that it fitted in four cases only.

The Dutch have a ship peculiar to that nation, called the "Galliot." These vessels are built with the sole view to their carrying capacity, and are more like our canal boat than anything that floats, the bow and stern being nearly vertical. The old sailor who almost

always has a bit of humor in his composition, has it that, "they are built by the mile and cut off as they want 'em." This nautical epigram, not inaptly illustrates the principles upon which the Shoemaker bit is constructed.

The Curb Strap.—Reviewing Major DWYER's chapter on "Bits and Bitting," Major CARR, Eighth Cavalry, in a thoughtful article published in the CAVALRY JOURNAL for July, 1888, says: "The slot in which the curb-strap is fastened being vertical and admitting of no play of the strap, has a tendency to keep the curb-strap almost at right angles to the bit, when the latter hangs naturally, so that it cannot be made to drop into the chin-groove or embrace the jaw equally at all points. It is impossible to make it hang or lie so as to act upon the jaw in the proper direction or without pain. This fault is enormously increased, when, as frequently occurs, a horse is supplied with a bit from three-fourths of an inch to an inch too wide for his mouth. An examination of the horses at this post would show the existence of a number having the little ulcers or callosities on the chin, mentioned by Major DWYER as the results of the improper action of the curb upon the jaw."

In addition to the foregoing, we note: The curb-strap being made of leather, stretches when it is wet, and contracts when it becomes dry, and after it has been thoroughly saturated two or three times, it becomes hard and inflexible, and liable to bruise the chin-groove, or the jaw. The best curb that we have ever had was the flat double chain, which, from its weight and flexibility, was always found in its proper place—the chin-groove.

In August, 1889, there were in Troop "C," Tenth Cavalry, no less than seven horses with fractured jaws. Five of these have been cured, one has been condemned and the other should be, as he has not had a bit in his mouth for nine months. There are to-day (March 31st) in the troop, besides the fracture mentioned, four ulcerated jaws, two wounded chins and nine lacerated tongues. And all this horrible mangling, mutilation and torture is due directly to the Shoemaker bit, which it would seem it is impossible to have replaced.

The Pistol.—There are two patterns, the better being stored away in arsenals, where "rust may corrupt," but where requisitions "do not break in." Neither is what a cavalry pistol should be, both being constructed with a view to "accuracy" and "penetration in pine butts," but the "Schofield Smith & Wesson" is vastly superior to the "Colt," in that it embodies one of the main principles which should characterize a weapon designed to be used in hand-to-hand conflicts, viz: rapid reloading on horseback.

It is almost impossible for anyone, not an expert, possessing all the skill and adroitness which that term implies, to load the Colt on horseback at any other gait than a walk; while the "Schofield, Smith & Wesson" can be loaded at *any gait*, and even without looking at it, an important item by-the-way, as occasions frequently arise in action when it is desirable to be able to watch the movements of the enemy while getting ready to shoot him, or to try, which so far as the ability to observe is concerned, amounts to the same thing.

In a comparative test made at the National Armory some years ago, it was demonstrated that, starting with empty chambers, the "Schofield, Smith & Wesson" could be fired nearly seven and a half times faster than the "Colt." And notwithstanding this stupendous, this incalculable advantage, there are men, and *cavalry* men too, who prefer the "Colt."

The Carbine.—While the armies of continental countries, in the frantic race to anticipate their rivals in the possession of superior death dealing weapons, are adopting without adequate trial the magazine pattern, and finding when too late that repeating arms do not in all cases realize what is expected of them, we in the exercise of a wise conservatism, born partly no doubt of a thrifty sense of economy, have continued our faith in the Springfield pattern, the most simple and at the same time the most effective single loader of the age.

Captain MAYNE, in his chapter on "Magazine Rifles" (p. 501-2), says:

"The principle on which magazine rifles depends, is to suppress the movements of carrying the hand from the rifle to the pouch, taking a cartridge from the latter, moving the hand back to the rifle and placing the cartridge in the breech. But the time of these movements, however, is not very long, and as the magazines of the magazine rifles at present before the public cannot hold more than ten rounds, the gain is not very great, and only exists while any cartridges remain in the magazine.

"Numerous experiments have shown that the continuous fire of magazine rifles is only more rapid than that of the ordinary breech-loaders while any cartridges remain in the magazines, and that there is no general gain in rapidity of fire in filling it again as soon as empty."

In the movements, which, according to this author, the magazine principle seeks to suppress, the advocates of the single-loader find their best argument, for no matter how short a time these movements may consume, they necessarily constitute a break in the operation of firing, during which the soldier's attention will, in a measure, be diverted from what is going on in his front; his excite-

ment partially subdued, he will be more amenable to fire discipline, because more liable to *hear* the commands of his officers, and in every way better qualified to act coolly and intelligently than if armed with the magazine weapon, where the "pumping" the cartridges and the pulling the trigger are movements so nearly alike, and occur so closely together, that, under the fever of excitement, induced by his surroundings, he is liable to forget which he is doing, and thus throw his shot away. The Springfield rifle can be deliberately aimed and fired ten times in a minute (experts accomplish even a higher rate), and while a properly constructed magazine gun, if it held that number of cartridges, would probably be able to fire them in one-half the time, it would have to "hustle" to do it, and when done, every shot would, in all likelihood, have been unaimed, injuring the enemy, if at all, by accident only, the chief result being noise.

The problem among the most difficult of solution in future military operations, will be the adequate supply of ammunition to the firing line, the difficulties increasing in proportion as the rapidity of the fire is augmented. Even with the old muzzle-loader, of "load-in-nine-times" memory, troops frequently, and at critical periods, found themselves out of ammunition, and when it is considered that this occurred with a weapon which, under the most favorable circumstances, could not be fired to exceed three times in a minute, and that the rapidity with which the single-loader can be fired, is capable of exhausting the "Mills belt" in five minutes, the frequency which troops, no matter how perfect the fire discipline may be, will find their supply of ammunition exhausted, is a prospect not pleasant to contemplate. And that this will occur oftener with troops armed with the magazine-rifle than with those using the single-loader, does not admit of question.

In what, then, has the magazine arm the advantage over the single-loader? The answer necessarily is: "Only in its increased rapidity in the delivery of 'unaimed fire.'" Unaimed fire, however, does not become a factor in the fight until the assaulting line is within two hundred yards of the enemy, at which distance the command, "Rapid fire!" is given, when it is, perhaps, discovered that a portion of the line has no cartridges to fire in any manner. There is no doubt that "rapid fire," in the last stage of the fight, independently of its *actual* effect (by which we mean the loss inflicted), produces a moral effect which cannot be disregarded, and in proportion as this influences the result, the unaimed fire of the magazine weapon becomes a factor to be considered. But, bearing in mind

that the gain in the rapidity of the fire of the magazine gun over the single-loader "only exists while there are any cartridges in the magazine;" that the magazine can be emptied in two minutes and-a-half; that until the magazine is refilled the soldier is practically unarmed and the fire, consequently, interrupted; that the single-loader can fire twenty shots, and, in fact, any number of shots exceeding ten, as quickly as the magazine gun; and, finally, that in a hotly disputed contest, before Victory perches on the banners of either side, many more than ten shots will be fired, the increased rapidity with which the first ten shots are discharged would seem to be of little importance. What will *tell* at this juncture will be rapid and *sustained* fire, and this character of fire can be kept up as long as the ammunition lasts or the soldier's strength holds out to support the recoil.

Notwithstanding that, influenced by the fear that some one may possibly discover more expeditious methods of killing people, the tendency of professional thought abroad is in favor of the adoption of the magazine pattern, we claim that the angle of the trajectory being practically the same, the Springfield rifle is in all respects superior to any magazine weapon that has yet been invented, and for these reasons: (1) The time required in opening and closing the breech-block insures a certain degree of deliberation, which conduces to accuracy; (2) while the soldier is performing these operations, the noise of his own gun at least is not heard, and he is better able to hear the commands of his officers; hence improved fire discipline; (3) the better fire discipline, the less waste of ammunition, and (4) from the simplicity of its construction, the Springfield never gets out of order. Has any one ever seen a magazine gun that did *not* get out of order?

If, as is claimed, the single-loader is as efficient as the magazine in the hands of infantry, there is certainly no reason for discarding it in the cavalry, which will rarely, if ever, have occasion to employ fire action except with the revolver, or in the individual and deliberate action of the skirmish line, but whose supreme moment, corresponding to the infantry assault, will be found in the mounted charge, with a weapon which, however much it may have been derided and sneered at in the past, must be the distinctive weapon of cavalry, if it is ever to amount to anything as such. These reflections betray us into reminiscence.

We remember that for several years after the reörganization and consolidation of 1871, when promotion was suspended and vacancies filled by transfers from other arms of the service, the saber suffered

a period of decadence, during which, except in the hands of an officer, one was rarely seen, most of the troops having them stored away in anticipation of an order to turn them in. We remember as recently as 1879 attending an "officers' school" in Texas, where, when the manual of the saber was reached, the instructor announced, "Gentlemen, we will *omit* the saber exercise; it doesn't amount to anything anyway, and I don't suppose any of you know anything about it." And notwithstanding some present warmly protested against this degradation of *l'arme blanche*, the saber exercise *was* omitted.

But better days are upon us. Under the influence, partly of awakened thought, partly of the infusion of new thought, the saber is rapidly becoming rehabilitated; and we feel an abiding confidence that under those competent to direct it—under those who are not saturated with the heresy that "cavalry cannot charge unshaken infantry," the future will render good accounts of the glorious weapon with which BREDOW's brigade of *only six squadrons*, saved the Third Army Corps at Mars la Tour.

In his last report, speaking of the progress made by the board convened to test and report upon magazine small arms, Secretary PROCTOR said: "Their experiments and reports of similar trials abroad indicate that magazine arms are still so far from perfection that it is not wise to change from our present excellent single loader to a magazine system in too great haste." It would thus appear that it is the policy of the Government to make haste slowly in this matter, and that no change will be made until it has been demonstrated that magazine arms are superior in all respects to the Springfield pattern.

It is thought that the inventive genius has somewhat of a task before it.

There are several minor changes which could be made to the advantage of the carbine.

The rear sight, except as it automatically compensates for the drift of the bullet, falls very far short of being an improvement on the old "buckhorn" sight, the leaf of which, it will be remembered, rested in the recess formed by the two side pieces of the base, which protected it from injury while being inserted in or taken from the boot.

If in view of the fact that we are not considered equal to the stupendous task of repairing a rear sight, but whenever one becomes sprung or bent, are compelled to ship sight, gun and all to an arsenal to be repaired by an "expert," we may be permitted with bated

breath, to approach so scientific a subject, we would venture to suggest that the principle of the "buckhorn" shield be adopted to the wind gauge on the present sight; this might necessitate widening the base of the sight perhaps an eighth of an inch, and increase the cost of manufacture a trifle, but it would give us a sight calculated to successfully withstand the rough usage inseparable from mounted service, which is the main thing desired.

The figures on the leaf are unnecessarily small, and at times difficult to read. They should be made larger and cut on both sides of the leaf—hundreds on one side, fractions of hundreds on the other; and they as well as the lines of elevation should be whitened.

The front sight is thick and clumsy, made so presumably to resist the hard service of the field; but since the adoption of the front sight cover, which effectually protects it from accidents, so much strength has become unnecessary. It should be altered to conform to the dimensions of that on the rifle.

March 31, 1892.

SNAP SHOOTING WITH THE RIFLE AND PISTOL.

By First Lieutenant JOHN PITCHER, First Cavalry.

AMONG all the fine shots which this country has produced, the art of snap shooting has been practiced by comparatively few, and these few were evidently not of a literary turn of mind or given to writing, for they have left no record of their accomplishments, and we are compelled to turn to traditions among sportsmen and reminiscences of the older officers of our service, to procure *facts* concerning what these men have done.

We have all heard the many stories told of an officer of the old army by the name of Martin Scott, commonly known as Coon Scott. They say he was as brave as a lion and something of a fatalist. Almost the last words he uttered as he sprang upon a parapet during one of the battles of the Mexican War, to look after his favorite dog which had gotten outside of the lines, was that the bullet was not yet cast that would kill old Martin. But unfortunately just at that moment a stray shot struck him squarely in the forehead, and he fell dead on the parapet. Thus died one of the early pioneers of snap shooting, and one of the finest shots the army has ever had, killed by a wretched scratch on the part of the Mexican who fired the shot. We can almost imagine poor old Martin's disgust at being hit in such an unscientific way.

It has often been told as a most remarkable feat, that Scott could with a pistol, put a bullet through two oranges or potatoes thrown in the air, catching them as they crossed each other. This I now have no doubt he could do, though I must confess that at one time I had serious doubts about the accuracy of this story. In fact, I no longer doubt anything that is told me concerning shooting, save that it is possible to make *sharpshooters* of every man in any troop or company that we now have in the service.

My attention was first called to "snap shooting" with the rifle, while stationed at Fort McDermit, Nev., by reading the accounts of

the wonderful shooting of Dr. CARVER, of San Francisco. I then took up the subject to see what I could do with it, using the carbine and service ammunition in my practice. For a target I was compelled to use stones, tomato cans, etc., commencing first with the cans, as they were the larger objects and sailed more slowly through the air. My greatest trouble at first was to get some one to throw the stones and cans for me, owing partly to the work involved and partly to the lack of faith which my friends had in me. But this difficulty I got around later by using a swinging target.

It struck me with astonishment to see the effect which the bullet from a service cartridge had upon the hardest kind of stone when fairly struck in the air, the result being simply a puff of dust, not a particle of stone apparently descending to the ground again. There is, however, nothing particularly astonishing in this when one comes to think of it, for we all know with what terrible force the 405 grain bullet, fired from the carbine or rifle, reaches its mark, and its effect upon a stone or similar object in the air is simply a practical illustration of the force of the blow struck.

I was greatly encouraged by my practice with the carbine, but found it rather an expensive amusement, for service ammunition at that time cost $30.00 per thousand.

Shortly after commencing this practice I was ordered to San Francisco, where I met Mr. HORACE FLETCHER, the President of the Olympic Athletic Club. This gentleman, I afterwards discovered, had given Dr. CARVER his first lessons in snap shooting, and from him I learned many valuable points on the subject. He purchased for me a Ballard rifle, caliber 22, and a case of ammunition, 10,000 rounds. Before that season was over I expended between 10,000 and 20,000 rounds of this ammunition, which, however, was very cheap, costing only about $20.00 a case. I mention this fact to show that I have at least had sufficient practice at this business to warrant my having an opinion on the subject, and one derived from practical experience.

Through Mr. FLETCHER I also purchased two bell balls to be used as targets, instead of the stones and cans which I had heretofore been compelled to use. These were the invention of Mr. FLETCHER, and consisted of two hemispheres of bell metal joined by a rod of the same material, the edges of the hemisphere coming close together. Tossed into the air the bell gives the appearance of a perfect sphere and when struck by a bullet from a caliber 22 rifle, produces a ringing sound which leaves no doubt as to the accuracy of the shot. They were intended to replace the glass ball which is used in many

ways for target practice, and have many points in their favor, economy being one of them.

Mr. FLETCHER is the author of a pamphlet on snap shooting, a part of which was embodied in a circular by General KELTON and sent to all of the posts in the Division of the Pacific. This circular is probably on file in the troop records of our regiment, and those who are interested in the matter would do well to look it up. The definition of snap shooting there given is in my opinion the best I have ever seen or heard, and if I remember it correctly it is as follows:

"Snap shooting is simply that united action of eye, the brain and the hand, which enables a man to throw the piece to the shoulder covering *instantly* the object which it is desired to hit, and pulling the trigger the moment the piece has been placed against the shoulder, without deranging the aim."

In other words, snap shooting in its best form is simply quick aiming and firing, and any one with moderately good eye-sight and who is accustomed to handling fire-arms, can with practice become a good snap shot.

To become an accurate and successful snap shot with the rifle, two things are absolutely necessary: the first is perfect familiarity with the curve or drop of the stock; the second is perfect familiarity with the weight of the trigger pull of the piece to be used; this of course means perfect knowledge of the weapon.

The first is necessary to enable one to bring the butt of the piece into exactly the same position against the shoulder at every shot; the second, in order that you may discharge the piece without deranging the aim. It is more desirable in this kind of shooting than in any other, that the trigger pull should be moderately light, but it is not absolutely necessary.

The piece should have a shot-gun stock, that is, with a perfectly straight butt plate, in order that it may be brought to the shoulder with the greatest ease and quickness. If the butt plate is curved it requires two motions to get the piece to the proper position for firing: first, to raise the piece, then to bring it back against the shoulder, and in the first motion the butt of the piece is very apt to catch some part of the clothing, and thereby cause considerable delay in getting it into the proper position, or what is more likely, to cause the piece to be fired before the butt is raised sufficiently high, and thereby overshooting the mark.

The best sights for the rifle in this kind of shooting are the open buck-horn rear sight and the silver knife-blade front sight. The trigger pull should not be more than three pounds.

In learning to shoot at moving objects, the practice should be commenced by two individuals, who should alternate in tossing the target and firing. The practice should begin at very short range, the range being gradually increased as proficiency is attained.

The man who tosses the target should at first take his place about ten feet in front of the firer, and about ten feet to his left, and endeavor to toss the ball or target about twenty feet into the air, and so that it will fall almost directly in front of the firer. This will give him the easiest possible shot. The target should not be tossed until the firer says "Ready!" and this he should not say until he is prepared in every way.

Success in snap shooting at moving objects, as in off-hand shooting at still objects, depends to a great extent on the position assumed by the firer. The piece should be grasped firmly but lightly with both hands, the left hand at a point a little in front of the center of gravity of the piece, the right hand at the small of the stock, forefinger on the trigger, pressing it lightly. The muzzle should be raised about the height of the eye, and the butt just below the right elbow, which should be slightly raised. The position of the feet and body should be the same as that described for off-hand firing in "Blunt's Manual."

The first effort of the firer should be to hit the target when it has reached the highest point of its flight, for at this point it apparently hangs for a second in the air, and after he has succeeded in doing this with ease he will soon find that he can catch it at any point of its flight.

In order to increase the interest in the practice, the firer should be given a certain number of shots, say five, with the privilege of shooting as many times thereafter as he can continue to hit the target, retiring and taking the place of the tosser on his first failure to hit after he has fired five shots.

A swinging target affords very good practice, and can be easily constructed by taking three pieces of scantling, ten or twelve feet long, fastening two of them in an upright position, supporting the third, and from the center of the third drop a piece of copper wire, five or six feet in length, at the end of which suspend a bell-ball or piece of steel. Each time this target is struck, unless hit fairly in the center, it will be given a different motion, thereby giving a great variety of shots.

At short range no allowance is necessary for the motion of the target, and the firer can aim directly at the object, but as the range increases, the allowance for the speed at which the target is moving

must be taken into account, and increases of course as the distance increases.

The ammunition generally manufactured for the .22 cal. rifles seems to be particularly poor, and on account of the light charge the rifle does not seem to clear itself after each shot, as in the larger caliber rifles. After firing one hundred shots and sometimes sooner, it will be observed that the piece has lost its accuracy, and it will be necessary to cease firing and clean before continuing the practice, for practice with an inaccurate rifle is worse than none at all.

Practice at snap shooting with the rifle at moving objects is of the greatest benefit to those who desire to become skillful wing shots with the shot-gun. Many fair shots with the shot-gun are perfectly satisfied when shooting at a flying bird if they score a point within a foot or two of the bird, or within a foot or two of the point on which they should hold, depending on the direction of flight, trusting to luck that some of the shot will reach the bird, and so they probably will, but the chances of killing are not nearly so great as when the aim is carefully taken, and the center of the charge of shot reaches the bird.

The absolute accuracy of aim which is required in practice with the rifle tends to produce the same accuracy afterwards in shooting with the shot-gun, and it also enables one to cover a moving object with greater ease and celerity.

There is another method of snap shooting, where the small of the stock of the piece is held at the hip, and when the piece is fired without any aim whatever, or any use of the sights. The piece is then used just as the bow and arrow are used, and about the same degree of proficiency can be attained with the rifle by this method as can be with the bow and arrow. Many theoretical shots claim this to be the true method of snap shooting, but with those who think in this way I differ most decidedly. I have tried this method, and met with so little success that I soon gave it up.

SNAP SHOOTING WITH THE PISTOL.

I should have left this subject for some one else to discuss, for I do not feel myself entirely qualified to do it justice, and it is one in which, just at present, we are all particularly interested.

I have on two occasions taken up the pistol with the intention of finding out for myself what could be accomplished with it, but on both occasions my practice was interrupted just as I was becoming deeply interested in it.

I however determined to my own satisfaction that exactly the

same principles apply in snap shooting with the pistol as with the rifle. In this my ideas conflict at once with the theory laid down in "Blunt's Manual." Colonel BLUNT is an exceedingly fine shot with the rifle, and has devoted a great deal of time and study to rifle shooting. What he has to say on that subject in his manual can scarcely be improved upon. He is, however, not an expert with the pistol, and frankly acknowledged that fact when he was directed to get up a system of pistol practice for the army. He called for recommendations from various officers on the subject, and the present system is the result. It is not an elaborate one, and was evidently gotten up with the idea that future experience would cause many changes to be made in it. Any system, however, is better than none at all, and therefore, those who are interested in the pistol should be duly grateful for what we have received. It only remains for us to point out the defects of this system, or to submit a better one, one which is the result of careful study and practice, and I am confident it will be adopted.

It is much easier to pick a system to pieces than it is to construct one. I shall not attempt either just at present, but I cannot refrain from calling attention to what I consider a decided error in Par. 833. Here it is prescribed that in snap shooting the pistol should be held raised and then quickly projected at the mark and fired *without pause or any effort to align* it upon the object.

This method corresponds to snap shooting from the hip with the rifle, and the same objections hold good in each case.

A certain degree of accuracy can be attained by this means, but a much greater degree of accuracy can be reached by using the sights, and doing what is here positively forbidden, that is, making a *slight pause* and an *effort to align the pistol;* if such pause and effort are found necessary, this necessity can only be determined by using the sights. The time required to do this is so little that it will be scarcely perceptible, yet the difference in the accuracy attained may be of the greatest importance. (Since this article was written a number of changes and improvements have been made in our system of pistol practice, and the modifications suggested above are now permitted.)

It has often struck me as a remarkable fact that the number of expert pistol shots that can be found either in the service or out of it is very small, or at least very small compared with the number of men who carry this weapon, and who are generally supposed to know how to use it. It is the only arm at present which an officer carries in the field, and the only one which he is likely to be called on to

use. Yet I think that in our entire army there are not to-day more than ten or twelve officers who can justly claim to be experts with the pistol in any kind of shooting. The reason for this is simply that up to the present day their whole attention has been devoted to the carbine or rifle, and the pistol has been almost entirely neglected. What little practice we have had with it, has been done in a perfunctory kind of way, and apparently only with a desire to get through with it as soon as possible, and with no hope of accomplishing anything.

Since the introduction of pistol matches at department competitions, however, quite a boom has been given to pistol shooting, and we may hope soon to have many fine pistol shots in the service. Practice is all that is required, but quite as much practice is needed to make a good pistol shot as is needed to make a good rifle shot.

There are some mistaken ideas concerning the use of the pistol, which are quite common. One of these is illustrated by this statement which is often made to the effect that, "I can not shoot very well dismounted; but just let me get on a horse and I can hit anything." In other words many men claim that while they are not good shots dismounted, they are good snap shots mounted. This has always seemed to me very unreasonable; a good shot dismounted will do well mounted, provided he can ride, and certainly better than one who is a poor shot dismounted.

In order to become a good snap shot with either the pistol or rifle it is necessary that one should at least become a fair shot by the ordinary method. This is necessary in order that one may become acquainted with the weapon and know all of its peculiarities, for like men, they all have them in one form or another.

The pistol which we have had up to the present time, has had many defects, but we have by no means exhausted its capabilities. The shape of the handle is, in my opinion, one of its greatest defects, and one which is the chief cause of poor shooting in rapid firing; the simple curve which is given it, renders it almost impossible for one to get the same grip at each shot. This defect is remedied in the new .38 cal. Colt's, which I hope may soon be adopted for the service.

METHODS AND ADVISABILITY OF THROWING HORSES.

By Second Lieutenant ELWOOD W. EVANS, Eighth Cavalry.

THIS is a subject that has, within the past few years, attracted some little attention from cavalry officers, and it is one well worthy of more than passing notice.

There are two reasons for throwing horses, requiring entirely different means. A horse may be thrown for a surgical operation or simply for discipline. In the first case, the sole object to be gained is to get the horse down, and in such a manner that as soon as he is down he will be not only unable to get up, but unable to move, thus making it perfectly safe for the operator to handle the horse at any part of his body. With this end in view, different methods are employed, varying with the position in which it is desired to have the horse when thrown. With these methods I will not deal, but will confine myself to the means of throwing a horse for disciplinary purposes.

The essential point to be gained in this is to convince the horse that the man is master. Hence the operation must be as far as possible a personal conflict between the trooper and the horse, thus requiring contact between the trooper and the horse.

Another reason that the trooper should be near the horse is that while throwing the horse the trooper should use his voice as well as his muscles, thus teaching the horse to obey the commands of his master. In other words, make discipline the means of education, and not solely a punishment.

Gentleness should characterize every action of the trooper in dealing with his horse, and this gives still another reason for the trooper being near the horse. When the horse turns his head or raises his foot as the trooper desires, the trooper should indicate by words and actions that the horse has done as he was wanted.

I will now give briefly a few of the methods used to throw or cast a horse.

Prof. GLEASON, who has had great success as a horse tamer, advocates the following: "Buckle around the off front leg below the fetlock joint, a strap to which a ring is firmly attached. Take a rope about eight feet long and fasten one end to this ring, the other end passing over the horse's back from the off side. Put a surcingle on the horse, and with the halter shank in the left hand, and the rope referred to in the right hand, take a position on the near side of the horse. Pull gradually on the rope till the horse raises his off fore foot, and continue till the fore leg is well doubled. Keep a tight hold on the rope so as to retain the leg in this position, and at the same time draw the horse's head around toward the left shoulder by the halter shank in your left hand. Press with your right elbow against the horses flank," and Prof. GLEASON claims that in most cases the horse will lie down.

Continuing, he recommends the following for horses that fight too hard when the former method is applied: "Fasten a strap, with a ring attached, to each fore leg below the fetlock joint. Use a surcingle with a ring on the under side. Take a strap about twenty feet long and fasten one end in the ring on the left fore leg. Pass the end of the strap through the ring under the horse's belly, then through the ring on the right fore leg and back through the ring in the surcingle. Raise the left fore leg and tighten the strap. Take the same position as in the other method, but pull the horse towards you. As soon as he makes a move, pull quickly on the strap with the right hand, bringing up his off fore foot, thus throwing the horse to his knees. Then bring the head around to the left and push him over."

The following suggestions apply in greater or less degree to all methods of throwing horses heretofore proposed:

First.—When the horse is thrown, the trooper is in danger of being kicked, in the struggles of the horse to rise, inasmuch as he and the horse's legs are on the same side of the horse's body.

Second.—The trooper, when the horse is thrown, is on the wrong side to control the horse, the proper place being back of the withers.

Third.—The position of the trooper required in these methods is on the left side of the horse, between the shoulders and flanks, a position decidedly dangerous if the horse has any inclination to kick.

As far as I know the first officer to use the throwing of the horses of his troop as a drill, was Captain DODD, of the Third Cavalry. The method used by him, which is, I understand, the one adopted for the new Drill Regulations for Cavalry, is practically this: "Tie up the near fore foot; fasten one end of a strap about ten feet long to the off fore leg below the pastern joint, the other end passing over the

horse's back from right to left; let the bridle reins hang down, or place them on the horse's neck. The trooper takes position close to the near side of the horse and behind the surcingle; grasp with both hands the strap passing over the horse's back, and pull his off fore leg from the ground; this brings him to his knees; then with the left hand bring his head around to the left, and the horse will go over on his right side."

In no case does Captain DODD allow the trooper to push the horse over, and this constitutes one of the main differences between his method and that of Prof. GLEASON. The horse is afterwards taught to lie down without straps by holding up his near fore leg with the left hand.

Captain DODD's method is also open to this objection: In throwing a horse it is far easier to stand on the off side to turn his head to the left than it is to stand on the near side to do the same thing. Moreover, in many, and in fact most instances, throwing a horse is only a step in the process of teaching him to lie down. For this reason the trooper to throw his horse on the right side, should stand on the right side, and thus be enabled to raise the right foot with the hand, when not using straps. In this way the horse, after a little training, will generally go down without dropping on both knees. He will first rest on his right knee, with the left fore leg extended to the front, and from this position drop over on his right side. This of course, supposes that his head has been turned well around towards his left shoulder.

Lieutenant J. R. RICHARDS, of the Fourth Cavalry, in an article which appeared in the JOURNAL OF THE CAVALRY ASSOCIATION, recommends the following method: "Tie up the off fore foot, and put on the horse a surcingle with a ring fastened to the top of it; attach securely to the halter at the two lower rings in the cheek straps, a rope, and pass the end of this rope through the ring in the top of the surcingle, from left to right; the trooper stands on the off side of the horse some six or eight feet from and opposite the hind leg; pull slowly till the horse yields his head to the near side, and then give a sharp, long, continuous pull till the horse goes down."

The method proposed by Captain RICHARDS possesses the great advantage of leaving the trooper back of the horse when he is thrown, and hence in no danger of being kicked, but the trooper is too far away from the horse to pet him when he does as he was wanted, and also the trooper is so far off that the idea that the rope has thrown him is left in the horse's mind, rather than the fact that the trooper has done it.

A method used by Captain (then Lieutenant) GILLMORE while he was in command of "C" Troop, of the Eighth Cavalry, seems to me to be safer and more effective than any that I have referred to. It is this: "Saddle the horse and put on him a watering bridle; tie up the right fore leg; fasten a strap (an ordinary halter shank will serve the purpose) to the near fore leg, below the pastern joint, and pass the bight over the seat of the saddle from left to right; throw the reins over the horse's head and pass them along the left side of his neck and through the fork of the pommel of the saddle from front to rear. The trooper takes his position on the off side of the horse, close to the shoulder, and takes the strap referred to in his right hand and the reins in his left. By gently pulling on the rein turn the horse's head well to the left, at the same time pull with the right hand on the strap attached to the near fore foot. This will bring a downward pressure on the horse's back, indicating to him the trooper's desire that he should go down, and also, in case the horse should move his left fore foot, as he is likely to do, it will raise his foot up and throw the horse on his knees. Then, by keeping his head well turned to the left. and pulling easily on the pommel of the saddle with the right hand, the horse will soon drop over on his right side."

My experience has been, that in a short time it will not be necessary to use the strap from the left fore foot, nor to use a strap to tie up the right foot. The horse will go down by raising his off fore foot with the right hand and turning his head to the left. Later the horse can be thrown, or rather made to lie down without the trooper dismounting, the trooper simply turning the head to the left by pulling gently on the left rein. I think that this method is superior to the others to which I have referred for the following reasons: The trooper, after the horse is thrown, is behind the horse, and hence in no danger of being kicked. He is also enabled to hold the horse down, should he attempt to rise, by holding the horse's head near his left shoulder by the reins. In this position the horse cannot possibly get up.

The position of the trooper at the shoulder of the horse while throwing him is safer, as by holding on to the pommel with the left hand after turning the horse's head, the movements of the horse can be easily followed, and the trooper is also in a better position to control the horse. Again, this position near the shoulder is the one that is necessary when teaching the horse to lie down without the aid of straps.

As to the practicability of this method, my experience with the

horses of "C" Troop, has shown that it is eminently so. Every horse in the troop was not only thrown, but taught to lie down without the use of straps, and this was done, not by a few men, but by the riders of the several horses. Such progress was made that on one occasion, between six weeks and two months from the time the teaching of the horses was commenced, I was in command of the troop at a regular drill, and within fourteen seconds after I gave the command, "Lie Down!" every horse was down, and not a trooper had dismounted. There is at present one, and I think, two horses in the troop, that will lie down on being told to do so by his rider.

I cite these examples simply to show that the method used by Captain GILLMORE, not only throws the horse, thus convincing him of the power of man over him, but also furnishes the means of teaching the horse to lie down.

It may now be well to inquire the use of all this; what is the necessity of throwing a horse? The main object is to teach the horse submission to the man. In one way or another this lesson has to be learned before a horse can be considered thoroughly broken. When a horse, four or five years old is taken into hand to break, the safest, quickest, and most humane way to accomplish it is to adopt this means of showing him who is master. The cowboy plan is much more brutal, and in the end the horse's spirit, rather than the horse, is broken.

In the cavalry service, where we seldom have to break our own horses, this method may be advantageously used to accustom the horse to unusal sounds, notably the rattle of the saber and the report of fire-arms. To do this, the horse should be thrown, and when he lies quiet he should be patted; then fire a pistol over or near him, and prevent him from rising by the means given; by petting and kind words he is given to understand that he is not to be hurt, and he will soon cease so pay any attention to the reports. I have seen the whole of "C" Troop firing with carbines over the backs of their horses while they were down, and few if any of the horses made any attempt to rise. As to the practical utility of this drill in field service, I claim for it nothing more than horse discipline, but this discipline will have its effect there as well as on the drill ground.

I do not wish to be understood as claiming that every horse in a troop should be thrown or taught to lie down; quite the contrary. I think the greatest judgment should be exercised in this matter, as well as the greatest care in the selection of the place to throw horses. This is particularly necessary when the horse is first thrown, for the chances are strongly in favor of the horse rearing and injuring his

knees; pads should be used or soft ground selected. After the horse has become accustomed to it these precautions will not be necessary, as the horse will drop very slowly and easily to the ground. The horses of "C" Troop were all taught on a large sand bank on the Cheyenne River. Even with this favorable place, one or two of the oldest horses became stiffened in the knees, and in consequence were unfit for hard work for some time. As a rule, however, it is the youngest and most restless horses that need the lessons to be taught by throwing.

This method of breaking horses is now having an excellent practical test at this post. Troop "L," Third Cavalry, now commanded by Lieutenant BYRON, of the Eighth Cavalry, is being supplied by contract with an entirely new mount. The horses presented by the contractor are all young and only partially broken to the saddle. Lieutenant BYRON is having each horse received taught to lie down. He told me a few days since that at the fourth lesson he could fire a pistol all around any of his horses, and they paid not the slightest attention to it.

Owing to the fact that some thirty or more horses, totally unbroken, had been turned over to this troop shortly after its arrival at this post, and that several of their number had been injured by these horses, the Indians had become rather timid in handling horses, but Lieutenant BYRON states that they are now rapidly regaining confidence in their mastership over the horse, and he ascribes this to the throwing. Thus it is seen that the practice of throwing horses is an education to the trooper as well as to the animal.

FORT MEADE, S. D., January 5, 1892.

SADDLE AND CAVALRY HORSES.

By Captain WILLIAM P. HALL, Fifth Cavalry.

THE demand for saddle horses is confined to two general classes of our people: those riding for pleasure and those who ride as a matter of business. The wealth and fashion of our country largely compose the former class, and as a result, in the larger cities is found a market for the fashionable saddle horse. Riding, as a matter of recreation and exercise, is productive of a different seat in the rider, and different gaits in the horse, from those usually employed when it is of great importance to get the maximum amount of ease, comfort and endurance to rider and horse. The ever changing fashion produces its effect upon the size, appearance and gaits of the saddle horse used by its votaries, and as that class of people make our English cousins their model in horsemanship, it needs no other explanation to account for the walk, trot and gallop being the gait of the fashionable saddle horse, and the hackney and hunter their designation.

Those who ride for exercise and pleasure desire an animal gaited at the walk, trot and gallop, and it is needless to say the two latter gaits will give one a lot of work, within a short time, if he sits down in the saddle and takes the jar. The practice of posting makes riding at these gaits much easier for man and beast. A vast amount, much of it interesting and instructive, has been written upon the origin and peculiarities of the hackney and hunter, and while the best authorities do not agree upon all points, still the salient outlines of history pertaining to these two classes of magnificent animals can be arrived at with reasonable accuracy.

More than five hundred years ago the importation into England of stallions from Arabia, Persia, Barbary and Turkey was commenced, and has been continued to the present day; the judicious mixture of this blood with the better grades of English mares has produced the world renowned thoroughbred and hackney, and the

progeny of the former, after years of breeding with our native mares, has produced what is known as a standard trotter and the gaited or standard saddle horse; both of these we believe improvements on anything in the shape of horseflesh ever produced. The gaits common to nearly all horses before they have been encumbered with a burden on their backs, are the walk, trot and gallop. The fashionable saddle horse has never been allowed to use his intelligence for the purpose of accommodating his gaits to the burden he carries; that is, so as to enable him to carry it with greatest ease to himself and comfort to the rider.

In our country the intelligence of a large class of horses, with the assistance of man, has so modified and changed the walk and trot as greatly to diminish the jar to the rider and horse when the latter is in motion, and these we believe are the best saddle horses to use when it is necessary to make long, hard rides at rapid gaits, and leave man and horse in fit shape to take the road next day. The gaits of this remarkable class of horses are the fox trot, running walk, rack and single-foot, and are so universal or so easily taught to certain families that they may be considered to a great extent natural gaits. The same horse rarely attains any great degree of excellence in all of these gaits, but so well are they adapted to the needs of the rider that during an experience of over twenty-five years with this class of saddlers, we have yet to see the first man who would choose anything else after becoming once well acquainted with this kind of a saddle horse.

A standard for the gaited saddle horse has been established about three years, and is based upon the number and quality of the gaits at which the animal is able to move, and these gaits are the ones most conducive to the comfort and endurance of both rider and animal. These horses in their easy gaits make fine "saddlers" for ladies, and we have heard it stated by parties who should be excellent authority on this subject, that it is only the strongest women who can ride a trotting horse for a very long time without permanent injury to themselves.

The walk, trot, pace and gallop are generally considered the natural gaits; the pace is common to a number of families, and as a rule, they do not trot without being forced. The trot is of course a diagonal gait—that is, a gait in which the diagonal front and hind feet move together and come to the ground at the same time. In the pace the hind and fore feet on the same side come down together, and when the pacing horse rolls from one side to the other, he is termed a "side-wheeler," and as a rule is an awkward, clumsy animal.

Pacing horses are easily converted into trotters, and the reverse, but the converted pacer and trotter is seldom so speedy at his acquired gait as he was at the original. A pacer is made to trot by weighting his shoes and riding over soft plowed ground; and the trotter is converted into a pacer by hobbling the feet on the same side within about twenty inches of each other, and giving the animal considerable travel in this shape.

Both pace and trot are poor saddle gaits, for the reason that both feet coming to the ground at the same instant gives to the horse, rider and load the maximum amount of jar; the rider can overcome this by posting or bending his body to the front or rear; the saddle and pack cannot do this, and as a result is a dead weight pounding upon the animal. It certainly needs no argument to prove that the amount of this jar will be twice as much when two feet come down at once as it will be when each foot comes to the ground at a different time. And this brings us to the fox trot, running walk, rack and single-foot, as they are designated by the dealers.

The fox trot is a modification of the regular trot to the extent that the front foot reaches the ground a little in advance of the diagonal hind foot; the feet and head are carried low, and consequently there is little knee action; it is an all day gait, easy on both rider and animal, and takes one along at from five to seven miles an hour. One can drop the reins upon his horse's neck at this gait and take frequent naps during an all night ride.

The running walk is the fox trot quickened by raising the horse's head, holding a tight rein and increasing the speed, which, with many horses, increases the knee action. At this gait the horse has a much more stylish appearance, and easily strikes a four minute rate; the feet, however, are moved in the same order as in the fox trot.

The rack is found in pacing horses, and is easily taught by causing the reins to vibrate while the animal is pacing, to such an extent as to break up the pace, which will produce a sort of modified diagonal gait with considerable speed, in which the hind foot touches the ground in advance of its diagonal front foot. This gait is seldom acquired by any but pacing horses, and while it is an easy and comfortable gait, there is apt to be too much of a rocking motion to allow the horse to appear very graceful.

In the single-foot, as its name indicates, each foot comes to the ground at a different time and with equal intervals between them; it can be taught, we believe, only to trotting horses, and is the most delightful and easy gait one can imagine. A good single-footer is a

"thing of beauty and a joy forever." The part of the animal's body holding the saddle has a smooth, gliding motion, swaying very little in any direction, the feet coming to the ground separately and at regular intervals gives the minimum amount of jolt to the rider and horse. We believe this gait can be taught to most trotting horses with little trouble, by gently breaking up the trot by vibrating the reins, not enough, however, to make the animal take the gallop. Horses having a low trotting action make the most graceful and easy single-footers, and will carry a saddle and pack weighing one hundred pounds, including nose-bag, lariat, hopples, etc., without that everlasting jolting, pounding and flapping incident to a cavalry command equipped for the field and put at the trot.

The rack and single-foot are fast gaits, sometimes attaining a mile in three minutes. These saddle horses are bred quite extensively in Missouri, Kentucky, Illinois and Tennessee, where much attention is paid to the selection of the sire, and we think nothing in the shape of a horse can be more beautiful than these saddle stallions. Their carriage, style and action is grand, and they have the power of transmitting it in a greater or less degree to their progeny. All of these horses of any note trace their pedigree back to four mile DENMARK, a thoroughbred race horse, from whom it is claimed this strain of saddle horses had its origin. They have been bred to mares generally owned by farmers, and produced animals possessing to a greater or less degree saddle gaits. The better grades of these horses are disposed of at private sales; a few of the more indifferent ones drift into our cavalry service.

Our cavalry mounts are purchased by contract, let to the lowest responsible bidder, and are carefully inspected by competent officers of the Quartermaster's Department or cavalry arm of the service, and it is the exception to the rule if these officers fail in doing their duty up to the handle; it is, however, equally the exception to the rule, if they get a good saddle horse.

Much has been written upon the size, appearance and conformation of good saddle horses, and many rules are laid down to guide one in selections; a majority of these rules, however, are of little use in practice, for the reason that it takes a vast amount of experience to learn the relative proportion, which the different parts of a horse should bear to each other. The plan we believe to be better than all others put together, is to get on the animal's back and try him at all of his paces, and if these are satisfactory the other points are generally good. The size of a saddle horse depends upon the height of the rider and the weight the animal has to carry; and we believe

they should never be over sixteen hands for the largest men and heaviest weights.

The three greatest drawbacks to our cavalry service having good saddle horses, are the lack of a suitable bit, want of knowledge in our cavalry officers and consequently in our men in the proper methods of breaking, training and bitting horses, and lack of quality in the animals purchased by the Quartermaster's Department.

A properly broken saddle horse must have a mouth sensitive to the action of the bit. Our bit is a powerful, heavy curb, and very few of our soldiers can sit a horse at the fast gaits without holding themselves in position by the reins; then again, when the horse moves at a rapid gallop or a run he must be supported by the bit. This heavy pull with a powerful curb ruins the animal's mouth, and the only remedy for it is a double reined bridle and a lighter bit; there are some excellent bits made of this class with double reins, with which the horse can be easily supported without injury to the mouth. To anyone at all skeptical on this point, let him observe any of our cavalry troops when they charge in line, and the command is given to trot, it will be seen that a number of horses keep up the charge and leave the ranks at different rates of speed with their riders swinging back with all their weight and strength upon these heavy bits. We believe there is not one horse in ten that can stand much of this treatment without having a broken jaw. By this is meant the small bones resting on top of the jaw bone, which become crushed and slough out of the animal's mouth by a slow and painful process, and this unfits him for saddle purposes.

There is generally little difference between cavalry troops stationed together for some time, and having about the same amount of drill. *A casual examination of one troop during the past six months, indicates ten horses with broken jaws, from the effect of our cavalry bit alone.*

The bitting, breaking, suppling and bending lessons to a saddle horse, are just as essential to make him a good performer under the saddle, as the gymnastic exercises of the tumbler to make him demand good wages from the circus manager. The training to which we refer is suppling the muscles of the head, neck, fore quarters, back and haunches; and the proper training of the muscles in a saddle horse is more important to make a good "saddler," than dancing lessons to a good dancer, or sparring lessons to a good boxer; and it needs but a casual comparison between the saddle action of a well trained school horse and of the untrained "saddler," to convince any one of the inestimable advantages of a thorough system

of this kind of training. The best work on this subject is "Modern Horsemanship" by E. L. ANDERSON, and if his directions are carefully followed, excellent results will certainly be obtained.

We think it is much to be deplored that none of the systems for training and breaking saddle horses are considered of sufficient importance to be introduced into the course at the Fort Leavenworth School, as it is the one thing without which it is absolutely impossible to have a properly educated cavalry horse. At the present writing we know of no cavalry officer competent to teach any of the systems of schooling horses. Suitable instructors in this business could, however, be easily obtained, but we fear this would be too near the practical work that should be required of a cavalry officer, to allow of its introduction into our military schools.

In order that this work may produce a good "saddler," we must have the proper material to begin with. This is not furnished, and the fault is with the head of the bureau making the purchase, which lets the contract for furnishing cavalry horses to the lowest responsible bidder. This results in our mounts being supplied from a class of horses known in the market as "plugs." Occasionally a good saddle animal will be obtained, and as a rule each troop of cavalry has two or three, and sometimes four or five decent saddle horses; our troop at present has two, and we believe that to be not far from the average.

Any one at all familiar with the business of buying and selling horses, knows that first-class animals in all the grades are disposed of at private or special sales, and any one desiring a good saddle horse simply goes into a section of the country, where such animals are to be had, and announces the fact that he wishes to buy a $175, a $200 or a $250 saddle animal, and there is no trouble in getting the horse, provided he is a judge of horseflesh; if he is not, it is far better to pay some expert a commission. If the Quartermaster's Department would send a reliable and competent officer into any of the saddle horse sections of Missouri, Illinois, Kentucky or Tennessee, and let him announce that he is buying $175 saddle horses, or simply buying saddle horses, and not limit him to the lowest market price of "plugs," then we would soon have a class of horses in which any captain could take a pride, and to which the rider would become attached.

The average "plug" now purchased for the cavalry lasts from three to four years, and rarely becomes fit to ride. The very few good saddle horses which drift into the service last ten or fifteen years, and are then sold, with many regrets. A cavalry troop

mounted on $175.00 or $200.00 horses would, with the average amount of wear and tear incident to our service, require remounts every ten or twelve years. In other words, a $200.00 saddle horse will last more than three or four times as long as a $100.00 or $125.00 "plug," leaving out of question the extra expense incident to frequent purchase and shipment of this "plug."

When it is considered that this "plug" at his best is seldom satisfactory for cavalry purposes, and that this matter has been represented time and again during the last quarter of a century, by officers who have made a life study of our cavalry service; when all these things are considered it would certainly seem a matter of surprise that a sensible method has not been adopted in so important a matter as furnishing remounts for our cavalry.

The trouble is not, as we have before stated, in the assistant quartermasters or the cavalry officers making the purchase, but is in the head of our bureau system of supplies. These heads are, as a rule, appointed from officers who have been the longest absent from any contact or touch with the line, and as a result know and care least about its requirements, and they are responsible to no one taking any interest in cavalry horses. We believe a former Quartermaster-General is responsible for the present system of buying cavalry horses by contract to the lowest bidder.

NOTES ON TRAINING REMOUNTS.

By First Lieutenant WILLIAM H. SMITH, Tenth Cavalry.

AS far as I have seen, very little attention has been given to training remounts in our service, except in individual instances, and even in these cases it has been more in the nature of an experiment, or for the experience gained by the officer himself, rather than any settled method or plan.

Officers will generally admit that the setting-up exercises accomplish a large amount of good for soldiers, and especially for recruits; whether or not they will admit that similar exercises would be equally beneficial for horses, and especially for remounts, I am not prepared to say, for I have heard very few officers express themselves on the subject; but I believe that a fair trial would convince almost every one of the good effects of a systematic course of training.

I do not believe it practicable to give our remounts the same amount of training as those of continental cavalries, and with the small amount of regular cavalry which we maintain I do not think it desirable; but on the other hand, to practice such methods of training in this, as in other respects, as would be applicable to our volunteers, upon whom we have to rely in case of war.

Every one will probably agree with the statement that a cavalry horse should be trained so as to readily obey the reins and leg of the rider, or in other words, that the rider should be able to hold and control his horse at all gaits with one hand and his legs, so as to leave the other hand free to use his weapons.

That he, the horse, should be trained to passage, turn on either his fore or hind feet, to walk four miles per hour, trot eight miles and gallop at the rates of twelve to sixteen miles leading with either foot at the will of the rider, to jump safely all ordinary obstacles under four feet high or ten feet wide.

I think all this, except probably the walking four miles per hour, can be accomplished in three months' training unless the horse has

been spoiled by previous bad handling, or is so badly shaped as to be unfit for cavalry service.

It is rare that more than six remounts per troop are brought to a post at one time. If some troops have more, others will have less, so I think it will be safe to say that the average will rarely exceed six. Supposing this to be correct, and that each horse is to be given two lessons per day of a half hour's duration each, then three men per troop will be able to train the remounts, each man training two horses; and for reasons given further on I would recommend that these men be the troop quartermaster-sergeant, blacksmith and farrier.

I would propose then that when remounts arrive at a post they be put in some empty corral or stable, or if none are available, that a picket line be established in some sheltering place, and sufficiently remote from other animals to prevent contagion in case disease should break out among them. Then for the purpose of feeding and guarding these remounts I would suggest that a non-commissioned officer and three privates be added to the regular guard detail; that some energetic officer, who takes special interest in training horses, and if possible, one who has had practical experience in the subject, be detailed to take charge of these remounts and supervise their care and training until they are ready to be assigned to troops.

In order to assist this officer in his work, I would recommend that the troop quartermaster-sergeant, blacksmith and farrier of each troop be ordered to report to him daily for an hour in the forenoon and an hour in the afternoon. In training horses it is very essential to have the same men each day so that a regular course of instruction can be pursued without wasting time in giving fresh instructions every day, and I have named the quartermaster-sergeant, blacksmith and farriers because these men can easily be spared from their troop for two hours daily, provided they are excused from other drills, parades, etc. And these men are usually bright, and have more or less aptitude for handling horses; besides after having undergone this course of instruction once they would be available for training other horses in the troop.

The same object might be accomplished by having three selected men from each troop put on daily duty for this purpose, but my experience has been that it is a very difficult matter to get a detail of this kind except for fatigue work. But I think it would be an excellent plan if troop commanders would voluntarily send all or some of their men when off duty to watch and assist in the remount drill, as the officer in charge might direct; and I might here remark that I think it would be most beneficial to all young officers to do the

same thing. To cite my own experience as an example, I can state that, although I have been studying and practicing this matter for over eight years, I believe I could have been taught all I now know about it in less than six months if I had had some competent instructor. It is something that cannot be learned entirely from books; they can aid one very materially, it is true, by giving him methods, ideas and the object to be attained, but to put these methods and ideas into practice is often a very difficult problem unless one has seen that practically applied.

Now as to the details of the training:

I would recommend that each horse be given a lesson in the forenoon and one in the afternoon of a half hour's duration each, and that the first, or as many more as may be necessary, be devoted to making the horse come to you with the whip, as described in paragraph 556, new Cavalry Drill Regulations. I regard this as the best foundation one can build on for training a horse. After the horse has been made to obey completely in this respect, the trainer has established such a morale over him that he yields much more easily in other respects. This can usually be accomplished in a very few minutes, and during the first month of the training I would recommend that each lesson be begun with it. This preliminary effected, I would suggest that the following course be pursued:

First Week.—Bendings of the head and neck, with trainer dismounted, as described in paragraphs 558 to 565, Cavalry Drill Regulations, making this part of the lesson last about a quarter of an hour; then for the other quarter of an hour the horse should be put on the longe, the first few days at the walk and then at the trot.

Second Week.—Same as for the first week, except that the trainer should be mounted during the bending lessons, and the gallop be added to the longeing, being careful to circle the horse about equally to each hand, unless the horse shows a preference for leading with one foot, in which case he should be practiced more on the other. In case a horse shows obstinacy at any period of the course of instruction, I would recommend throwing him, and repeating the operation as often as the obstinacy recurred.

Third and Fourth Weeks.—First five minutes of each lesson devoted to bending the head and neck, the next ten to the bendings of the croup, as described in paragraphs 387 to 389, Cavalry Drill Regulations, and in place of the longeing the horses should be ridden around on small circles, alternately at the walk and trot, changing direction frequently, the men being careful to see that the horses bear lightly on the bit and carry their heads in a good position.

Fifth to Eighth Weeks.—The next four weeks should be a repetition of the last two, and in addition, once per day the horses should be exercised in the "jumping pen," commencing with slight obstacles and increasing them a little every few days, until jumps four feet high and others ten feet wide are attained. A good form of "jumping pen" may be constructed as follows: Build a circular fence about 100 yards in diameter and about six feet high; then on the other side of this and about twelve to eighteen feet from it, another circular fence, thus making an enclosed track of from twelve to eighteen feet wide and between 300 and 400 yards long; on this track hurdles of various kinds and ditches are constructed. Into this inclosed track several horses are turned by means of a gate or pair of bars. Men with whips are standing at intervals along the fences on each side of the track, and urge the horses over the jumps, care being taken that some steady jumper is put in with the other horses to lead them. In this way a horse learns to jump by himself, and without associating the exercise with the pain of the spurs or the pulling on the bit.

Ninth to Twelfth Weeks.—The first ten minutes of each lesson should be devoted to the bending of the neck and croup, and the last twenty to circling the horse at the walk, trot and gallop, paying particular attention to the carriage of the horse and his bearing on the bit. After the horse leads equally well with either foot, he should be practiced at changing step while at the gallop; and towards the end of each lesson he should be ridden over a few jumps.

It may be remarked here that the new Drill Regulations are wrong in their directions for making a horse lead with either foot, and that it can only be done by employing exactly the opposite means to that laid down. That is to make him lead with the right foot for instance, one must carry the bridle hand slightly to the right, and press the left leg and vice versa. The above course is laid out for the average horse. Some will require more of one kind of practice than others, and to prescribe variations in the course to suit each particular horse, requires considerable experience and study. But I believe that if the foregoing course is thoroughly carried out, that the remounts will be settled in their gaits, and easy to handle and ride, and that they will remain good and serviceable horses for years longer than they otherwise would. But for the first year or two after being assigned to troops, the remounts should be ridden by well instructed men.

CONVERSATIONS ON CAVALRY; BY PRINCE KRAFT ZU HOHENLOHE-INGELFINGEN.

TRANSLATED FROM THE GERMAN,
BY FIRST LIEUTENANT CARL REICHMANN, NINTH INFANTRY.

PREFACE.

THE conversations on cavalry, which I bring to the knowledge of the cavalry officers of our army in the following pages, did actually take place as rendered by me. I had these conversations with one of our highest cavalry officers, a man of large experience in war and peace.

When he unfolded to me his ideas, I urged him to make them the common property of our cavalry, by means of the press. But his endless duties left him no time for it; I therefore undertook to write down the contents of these conversations.

That the conversations took place and were written down before the publication of the latest Cavalry Drill Regulations of 1886, is apparent from the date of each conversation. To this point I only invite the attention of those of my kind readers who may fail to notice the date of each conversation, in order that they may keep in view that whenever the latest regulations are mentioned, those of 1876 are meant. On the whole, it is a matter of indifference upon which of the two regulations the discussion is based, my only purpose being to lay down indisputable truths for cavalry action.

A cursory reader may perhaps charge me with useless repetition in many places; I ask his indulgence. But the professional man, who follows attentively the evolution of the ideas here laid down, will concede that frequent repetition of the same principles cannot be avoided, if in the different duties and training of cavalry they lead to conclusions which must be discussed separately.

Again, if the character of a friendly conversation is to be adhered to, it is more difficult to avoid repetition than in a strictly scientific work, which this work does not claim to be.

For this reason, I also ask the indulgence of those who peruse this little work superficially as "sofa literature."

DRESDEN, July, 1886. THE AUTHOR.

FIRST CONVERSATION.—GENERAL REMARKS.

S. I have read your military letters on cavalry with great interest, and must, as a cavalryman, express my thanks for having a non-cavalryman defend our branch of the service against the many exaggerated charges recently made against it.

H. I did it from a sense of gratitude, for even now I vividly recall the feeling of security on the march, and when at rest, which the army enjoyed under the protection of the cavalry, scouting far in advance.

S. Having told you only that I am grateful to you for your good opinion, I hope you will not be offended if, nevertheless, my opinion differs from yours on many important and unimportant points.

H. On the contrary; it would be foolish not to admit differing opinions. It would be doubly foolish on my part not to listen attentively to the opinions of a professional man, who has served all his life, wide awake, in a branch of the service which I can judge only from the standpoint of the amateur—the disinterested spectator. I shall listen to your objections all the more willingly, as they come from the branch of the service for which I took sides. For this reason a discussion between us two can never assume the character of an impassioned controversy, which so frequently impairs good comradeship and prevents mutual elucidation and useful information. Go on, therefore; I listen.

S. In the first place, I am of the opinion that you have bestowed far too much praise on us.

H. But my praise, my admiration for the achievements of the cavalry, are the expression of what I saw and felt. Even during the war I often stood up for the cavalry, when in the course of the conversation it was asserted that infantry and artillery alone had done great deeds.

S. Believe me, I am not standing alone with my opinion, that you have bestowed too much praise on us. It is shared by every comrade of our branch of the service who has formed his own opinion from the experiences and the study of the war. You have set forth our achievements as though we had been the ideal cavalry, while every one of us feels how far we fell short of that. In reading your words one realizes again how far our actual achievements fell short of what should have been achieved, and how much is still susceptible of improvement.

H. If that is the case the superabundance of my praise has had a good effect only, for nothing but striving for perfection will revive

the feeling of not having done enough. If this feeling is caused, not by adverse criticism but by praise, something agreeable, the effect must be all the greater. Without knowing it, it seems, I effected much good.

S. That is all very nice, but unfortunately such praise is apt to confirm many in the opinion that everything is best as it stands now, and does not need improvement. We must recognize, confess, express, how and where mistakes were made. The first condition for improvement is, that imperfections be recognized.

H. It goes without saying, that wherever men undertake anything, human weakness becomes perceptible, and therefore even what is most perfect falls short of the ideal. In reading my work you probably perceived that I am well aware of mistakes made by individuals. But I did not feel called upon to uncover the mistakes of individuals, to criticise them, to expose them before the public.

S. Nor do I think of such a thing; that is the business of the superior officers, and, in the last instance, of the supreme war lord. But the red thread that goes through your work is the assertion that the principles on which our cavalry was used in the War of 1870–71 were correct, that as a rule it was well led, that its action was correct, and that, on the average, its peformance was very satisfactory. You go so far as to call the use of the cavalry at Vionville-Mars-la-tour a normal one.

H. It is the opinion that I have actually formed. Nor did I mean thereby to convey praise beyond what was actually earned, in order, perhaps, to urge some on towards the ideal. Those individuals only, who fell short of what was the average achievement of the whole cavalry may feel themselves urged on. I believe I was right to say so. Was not the Uhlan the terror of all France?

S. The Uhlan could easily become a terror to all France, since the French cavalry was even less judiciously used than ours. I simply deny that our cavalry was properly used, well led, that its action was correct, that its achievements were satisfactory; I deny that the use of the cavalry at Vionville was a normal one.

H. It often happens that those who criticise themselves, do so too harshly. To know oneself is a fine thing; but he who judges himself too harshly, runs the risk of despairing of himself, instead of sharpening his appetite for work. Is not the principle on which in the War of 1870 our cavalry was used by the supreme command of the army a correct one? Were not the masses of the cavalry pushed far in advance for reconnaissance? In case of battle, was

not the cavalry held ready in reserve? Are there not numerous examples of ample pursuit?

S. In so far as concerns the demands made on our cavalry from army headquarters, I have no fault to find. But how far did it often fall short of these demands?

H. Simply because nothing done by man is perfect. You also said you did not wish to expose the mistakes of individuals.

S. Nor do I mean to; I say it was the fault of the principle, not of the individual. A genius like SEIDLITZ would probably have accomplished more with that cavalry. But you cannot demand that every cavalry leader be a genius like SEIDLITZ. Such geniuses are not often born. The system of the training of the cavalry must be such as to produce leaders who know how to direct properly the masses, who undertake great risks with them; yet these leaders need not be gifted by nature above mediocrity, so long as they are vigorous, active, brave and chivalrous, like all our officers. But our system of training the cavalry is not apt to produce such leaders.

H. I am surprised; then you call our cavalry poor?

S. Not at all; our cavalry is imbued with the very best spirit. Our officers yield to those of FREDERICK THE GREAT neither in zeal, bravery, nor self-sacrifice; our horseflesh is even more blooded and effective than that of the last century.

H. Well, what more do you want?

S. Spirit and horseflesh alone are not sufficient to make good cavalry. If the horseflesh is not trained and kept up in a rational manner, it will fail to keep up with the spirit in its flight.

H. I should think that our horseflesh proved very effective in 1870, and kept up with the flight of the spirit.

S. You have, it is true, mentioned in your letters several instances of important services rendered by the cavalry. I can add to the number of these examples from my own knowledge. I might name you a brigade, which marched from Beauvais to Gisors to participate in the capture of that place, and returned to Beauvais (sixty kilometers) the same afternoon, marched next day from Beauvais to Gournay and returned (fifty kilometers), rode on the fourth day from Beauvais to Breteuil, where several charges were made by individual squadrons, and returned to Beauvais the same afternoon (sixty kilometers), 9th, 10th and 12th of October, 1870. Our horseflesh is, therefore, very effective and enduring, if appropriately and rationally handled. But were we always ready to make such demands on our cavalry? How many times after a victory did we lose touch with the enemy? How was it possible for VINOY to escape

to Paris? Why did not our masses of cavalry, which were in readiness, swarm around him and destroy the railroad in his rear? Did our cavalry reconnoiter sufficiently during the winter? How could the enemy's armies, coming to the relief of Paris, have appeared in some places as though sprung from the ground, and without our knowing anything about them until they were close upon us, if our cavalry leaders had dared to make from fifty to one hundred kilometers per day with sufficiently large bodies?

H. During winter ice impeded the rapid movement of cavalry.

S. Ice! Why did it not learn to ride over ice? That is just it. Not even SEIDLITZ could have accomplished anything on ice with cavalry which had not been taught how to ride over ice. Some individual brigades had been taught how to ride over ice, did reconnaissance duty on ice; the others could also have done it if their leaders had convinced themselves of its feasibility by practice in peace. This, however, is a point which I do not desire to discuss to-day, but to which I shall perhaps refer later on.

H. But you will concede that whenever the cavalry charged, its action was unsurpassed.

S. So far as it was within its power, yes; it was brave, we must admit; what bravery and zeal could accomplish, it did; but that is not everything. What were the isolated, loose attacks to effect, which in the battle of Vionville you call normal? What would have been the result of closed attacks?

H. Well, let me remind you that formerly we were taught that in nine attacks out of ten of cavalry against cavalry, one party would wheel about before the contact; this rule was based upon the experience of former wars. In the War of 1870 such a wheeling about did hardly ever occur; nor did it in 1866. The cavalry of both sides invariably rode into each other and decided the fight by individual combat. The cavalry of 1870 could, therefore, not have been inferior to former cavalries in vigor of action.

S. That's just it. This riding into one another discloses the weakness of the cavalries of to-day. I must concede that the vigor of action, bravery and eagerness for the fray of the present cavalry leave nothing to be desired; but the reason why former cavalry did not ride so much into one another, was that they rode so well closed that they could only ride against, not into, one another. FREDERICK THE GREAT specifically criticised loose charges, because they were followed by a mêlée, and added: "I do not want a mêlée; the cavalry must charge en muraille." Thus it became imperative for the party, which knew it would be overthrown, to avoid contact. Our present

cavalry is not always able to ride so well closed, because frequently the horses are not well enough trained.

H. But you will concede that at Vionville the cavalry was used several times in quite respectable numbers?

S. Masses were used, not, however, in masses, but in driblets. A regiment became engaged and then everything in the vicinity was sent for by regiment, even by squadron, and thus the atoms were flung into the fight without following a premeditated plan and without unity of command. Who, I say, commanded the entire German cavalry on the left flank? The official account does not name a common leader.

H. That was, I think, principally due to the considerable numerical superiority of the French army, which compelled the German infantry to fight in a single thin line, to which the cavalry, distributed in rear, formed the second line. When it became necessary to oppose cavalry to the French cavalry on our left, our cavalry brigades and divisions were already scattered and the units of command broken up. Is it not in the first place the duty of the commander-in-chief to direct the cavalry masses to a place on the battle field from which they are all able to coöperate, taking into consideration the character of the ground? If he does not direct them so, or is prevented by circumstances from doing so, the result will probably be that the cavalry is flung into the fight by driblets or arrives by regiments, brigades or troops.

S. It is true, in order to ensure the fullest use of this branch of the service as well as the others, the first requisite is that the cavalry be assigned to a proper place for its action. But even where this was the case, our masses of cavalry did not always achieve what might have been achieved. The principal reason was that we had too few leaders competent to lead large masses of cavalry in the charge against the enemy in proper shape and with full force.

H. I thought you did not mean to criticise individuals?

S. Nor am I criticising them—neither the individual leader nor the leaders in general.

H. But you just said—

S. That we had too few leaders competent to lead a large force of cavalry in the charge against the enemy in proper shape and with full force. It is not the fault of the leaders, it is the fault of our system of cavalry training; it failed to produce the leaders.

H. I do not understand you.

S. Do you believe that a SEIDLITZ, ZIETHEN, DRIESEN, GESSLER, etc., were born as cavalry generals and cavalry geniuses? They are

the exponents of their time, *i. e.*, of the system of training which the Great King inaugurated for his cavalry.

H. So far as SEIDLITZ is concerned, he distinguished himself as cornet in the First Silesian War; in the Second Silesian War, WINTERFELD, in a report to the King, calls him the coming man.

S. And DRIESEN? Did not the Great King, upon DRIESEN's great achievement at Leuthen, exclaim in surprise: "What! DRIESEN, that fool?" and you must allow me the King knew his men. You see here both a genius and the opposite of a genius gaining great successes with large masses of cavalry. Better proof cannot be produced, that their successes are the result of their time, *i. e.*, of the principles on which their training was based.

H. But we hear and read nothing but that our cavalry are folfowing the rules laid down by the Great King for his cavalry.

S. Theoretically, yes; practically, not quite; in general tactical rules, yes; in their practical application, not always; in the demands, yes; in the execution, no; in the plan how to employ masses, yes; in the method of preparing them for such use, no; least of all in the method of training the atom to take its place in the mass, and to move with the mass; I mean the individual training of the cavalry soldier.

H. But surely, cavalry, although its individual training may be incomplete, can be used to advantage in masses, provided it is led according to the principles of FREDERICK THE GREAT.

S. Allow me to dispute that point.

H. Take MURAT for instance; the individual training of his cavalry was below mediocrity, yet it achieved many a great success.

S. MURAT did not lead his cavalry at all according to the principles of FREDERICK THE GREAT; he formed deep massive columns and put them in motion toward the point of attack. Not one of the horsemen of these masses would have been able to give his horse another direction, had he meant to do so. Besides, MURAT attacked at a trot to preserve the close formation; that was not in accordance with the principles of the Great King either.

H. I admit the fact that the men had no control over their horses. My own uncle who brought up a brigade against MURAT's great attack at Liebertwolkwitz, told me that his horse ran away with him (he had just mounted a troop horse, his own having been killed). It ran with him toward MURAT's masses and passed them within ten paces. The hostile horsemen cursed him and struck at him, but not a single one had sufficient control over his horse to approach him, and all rushed on in the direction once taken, in one

wild, deep mass, without order and without stop. Hence it would seem that, although MURAT started the cavalry at a trot, it became voluntarily or involuntarily, a runaway at full speed. Nor did they remain closed up, at least they did not preserve order, for my uncle describes them as a wild, runaway mob.

S. And what did the charge with the runaway horses you just mentioned accomplish? They rode through some Russian batteries, when they were charged by several regiments of the allies, which although greatly inferior in numbers, drove them back as fast as they had come.

H. But at Hagelsberg, MARWITZ's newly formed cavalry with its untrained, runaway horses also achieved success.

S. A large part at least of MARWITZ's horsemen were efficient, veteran cavalrymen of a good school. But I have little use for cavalry, which bolts in the first charge and is not on hand afterward. Colonel VON BISMARK did not dare to let them charge again, and said: "It is easy enough to let them loose; but whether I shall again see a single one of them, is another question. I cannot take the responsibility." (MARWITZ).

H. That is not to be expected from our present cavalry.

S. It is! In one of my engagements during the last war I ordered a troop to charge a troop of the enemy. Both sides rode into each other, as you call it, approvingly, then the whole mass moved forward (as seen by me), and beyond control, all bolted, friends as well as enemy. Hostile masses approached. Our horsemen could not be restrained. The trumpet signal "Rally" had no effect. They only stopped bolting when they received hard knocks from the enemy's supports. I am almost inclined to believe, that with cavalry which bolts thus, the direction in which it bolts is pure accident, and also whether it will be victorious or defeated.

H. Is not your criticism too severe?

S. Perhaps upon the whole I have expressed myself too strongly; I will, however, quote the following instance: A cavalry division of six regiments, defeated, was to be relieved by another division of the same strength. Owing to a misunderstanding the former ran into the latter "*en débandade*," carried it along at full speed, and both divisions bolted pêle-mêle in wild haste.

H. I must say, that I do not recall an instance in war history in which twelve regiments of cavalry ran away together.

S. I believe you, for to know it, you would have to read peace history, still unwritten. This case happened in the field exercises

of an army friendly to us. Neither division was opposed to an enemy, not even an outlined one.

H. How fortunate for them not to have that experience in war. Both divisions would have been charged with cowardice and disgraced.

S. And yet they would have been innocent. To a cavalry which is apt to bolt, such a thing may happen, no matter how brave it may be otherwise. Am I right now in saying that the direction in which it bolts is accidental?

H. It would almost seem so. But it is possible to train cavalry so that it will never bolt, even involuntarily.

S. Certainly it is. What was possible in the time of FREDERICK THE GREAT must be possible now also. In FREDERICK'S cavalry such bolting was unheard of.

H. You think so? How was it with ZIETHEN'S entire cavalry in the battle of Prague?

S. That is a special case. The horses of that cavalry did not bolt against the will of the riders; during the pursuit they struck the enemy's baggage train and began to plunder. Did not ZIETHEN report it to the King, that his entire cavalry was drunk? A rider whose horse bolts, can neither plunder nor drink.

H. I still fail to understand what you said just now, that it was due to our system of training, that we had few leaders competent to lead closed divisions against the enemy.

S. Nor can you understand it by yourself, because you have not gone through this method of training yourself. But you will easily understand it when I explain the reasons.

H. I am curious to know them.

S. Our instruction in riding during the entire winter takes place on the level ground of the riding hall or drill ground. This winter lasts from the first of October to the first of April or May—six or seven months. It is followed by troop and regimental drills, also on level ground. It is only during the short time of detachment exercises and maneuvers, not quite four full weeks per year, that our cavalry has an opportunity to ride over any kind of ground. Will the horse thus be sufficiently practiced to pay attention itself to the ground? Can the rider gain the confidence in his horse, that it will carry him over any kind of ground, so long as he remains firm in the saddle, and lightly feels the horse's mouth? Can he keep his eye exclusively on the enemy and on his proper place in the troop? Must he not look out carefully for every rock or furrow, disquiet the horse by pulling the rein, derange the formation of the

troop? A leader brought up in this school cannot have the confidence to lead his closed division against the enemy, knowing that every potato field, every new direction across or oblique to the furrows, loosens the formation. He prefers to send his cavalry against the enemy by troops or regiments, keeping a reserve on hand, rather than to ride across country with the whole formed in several lines. The vigor of the mounted man begins to decline at forty or fifty years of age. With our system of training the leaders become accustomed to spend most of the time of duty in the riding hall standing around dismounted. They become disused to riding, in war it becomes a hardship to them, and this has a bad influence upon the enterprise, the eagerness for the fray, the headlong charge upon the enemy with the whole mass.

H. But it is the division commander's duty to keep a formed reserve and not charge upon the enemy with all his troops.

S. If cavalry cannot rally quickly, certainly. In the time of FREDERICK THE GREAT, when cavalry rallied quickly at the first signal, you do not find any rule that charging cavalry was to have a reserve, because a closed reserve could be quickly formed upon giving the signal. The instructions of the Great King lay down the formations to be used for the charge of large bodies of cavalry—a first echelon, closed, in line. On each wing, overlapping, and at a distance of a few hundred paces, five or ten troops of hussars to assail the enemy in flank and rear, and pursue, also to cover the flank, then a second line (to-day we would call the hussars the second, his second line the third), which frequently follows directly in rear of the first and is to fill up gaps. This formation the Great King prescribes for the charge of masses of cavalry of twice or three times the strength of a modern cavalry division. His masses of cavalry had to charge that way over all kinds of ground, without selecting level drill grounds.

H. I should think the cavalry, in those days, also had riding halls, rings and drill grounds.

S. Yes, for the first training of the remounts and recruits and for practicing the first principles of elementary tactics. But inspections of troops or regiments were not made on the drill ground, nor of the riders in the riding hall. The Great King inspected the cavalry on any kind of ground; he took position wherever he happened to be, and required the cavalry to charge toward him without the ranks becoming disordered by the ground.

H. Then you think that troops and regiments should now also be inspected on any kind of ground?

S. That alone would not be a thorough remedy, nor could it be carried out very well.

H. Why not?

S. Because our horses are not fitted for it by the winter course of training.

H. What has this training in winter to do with it?

S. If I wanted to explain it to you thoroughly, I would have to write a book about it. To-day I shall only give you an outline. Our horses are broken anew every year for seven months, and by what kind of riders? Look at that traverse, renverse, true gallop, which is there sometimes—I can find no better expression—committed. The riders hang on by the reins and thus play riding-master for seven months in the year. A good remount rider may have broken a horse correctly for a year; next year it is perhaps all undone by a bad rider. The men get in the habit of believing that "kniebeln"* and pulling back, is riding, for the instructor strives to have his class pass well on inspection, to stand the test of the prescribed program. If he does so, he is in favor, hence during these whole seven months he works with his class (be it the class of remount riders, second class or recruits), with the sole view to this inspection (inspection of riding with snaffle or final riding inspection). If he only passes according to the program, he does not care what comes afterward. The horses are thus tormented into unnatural paces, horses and men mistrained, for training, instead of being a means to an end for cavalry, becomes devoid of purpose and is mistaken for riding. There, by rude use of bit and thigh, spavin and curb are caused; there the rider hangs on by the reins and ruins the forehand by a gallop, in which the hindquarter flings instead of carries, and the weight is put upon the forehand. Many horses are already half broken down when presented at the final riding inspection. By this mode of training the horses are being stupefied during eleven months in the year, at least their intelligence as to the ground is not developed; they do not learn to look out for themselves. Would you lead a mass of horsemen across country with confidence if you knew that a large part of the horses were broken down, and if you had to anticipate that on uneven ground a large part of the horses would stumble over insignificant obstacles from sheer stupidity, and fall?

H. I begin to understand you.

S. I am not through yet. Through faulty breaking many horses get into the habit of bolting. As long as the riding hall and ring are used, the horse will stand the ill-treatment five times a week for

*Indiscriminate and faulty knee action of the rider.

three-quarters of an hour, but when he is taken out into the country, if he becomes excited, he puts his chin against the chest and bolts blindly, seeking relief. Two or three such bolters throw a whole troop into disorder, and many a troop has more than two or three of them. But nowadays the cause of the evil is never investigated at all. You can hear a troop commander say: "This horse is a bolter; that horse is broken down," as though it were a matter of fate; the same as one says: "It snows," or, "it rains."

H. Can it be really as bad as that? On watching a troop at drill one sees but few crooked legs.

S. Yes, in the spring, but not in the fall. Then the troop commanders complain that the horses cannot stand the strain of the maneuvers. After the divisional maneuvers we have seen horses barely able to move, and which had to be dragged along by their dismounted riders into the garrison from the first rendezvous. What is the cause? That the winter training, instead of increasing the efficiency of the horses, has deformed, ruined them, and laid the seeds for breaking down, which only shows itself under the fatigues of the maneuvers.

H. In what particular detail did the training of FREDERICK THE GREAT differ from ours?

S. I can only touch upon this point briefly, but shall explain it in detail later on. In the time of FREDERICK THE GREAT most horsemen were taught to ride and use their arms, on well broken horses only. The young riders were not allowed to break their own horses or teach them paces, but they left the riding hall and ring for good as soon as they had learned how to ride, to exercise their horses at will (tummeln), as the Great King called it in his orders, in winter and summer, or to drill. Thus they learned how to ride in the terrain, to ride on frozen, smooth ground in winter, for they found time for it, because in those days the horses were not ill-treated by the rider's knee (kniebeln) in the riding hall seven months in the year; nor were horses mistrained, because the horseman, without aptitude for breaking horses, never learned at all how to train—mistrain—"kniebel" horses.

H. Then you think that riding in the hall was not much thought of?

S. On the contrary, it was cultivated more and more thoroughly than now. Only specially fitted horsemen, however, were trained in it after several years of service. They broke the remounts. The few recruits required by the troop, owing to the long term of service, were put on the best broken horses, where they at once learned the proper seat and touch; and if an awkward recruit happened to teach

a horse a bad habit, it was at once turned over to an experienced old rider to rebreak it.

H. All this was well enough then, with the long term of service, requiring few recruits and furnishing many experienced horsemen of long service. But it seems to me impracticable with a three years' service.

S. Yet it is practicable in a modified way; I'll explain it to you at some other time. The transition from the long term to the short term of service, together with the universal liability to military service did not take place properly. It is not the fault of our generation that we do not have a cavalry like that of the Great King; it is not the fault of those leaders who could not be in a position to lead great masses of cavalry. The system of training universally adopted after the Wars of Liberation, is to blame, if the great grand-children of the SEIDLITZES, the ZIETHENS, the DRIESENS fall so far short of the ideals which formerly had been realities. You see I do not blame individuals; I do not censure any one for insufficient achievements in the last wars; on the contrary, I defend them all. The principles of our present system of training are what need improvement.

H. Then you mean, that since 1815 our cavalry has gone backward?

S. I do not; the cavalry has advanced wonderfully, for in 1815 it was almost naught, as appears from the reports of BLUCHER, THIELEMANN, BORSTEL and MARWITZ. Since then it has worked hard and improved from year to year. I think now is the time to give the last impetus to bring it up to the level on which it stood in the time of the Great King.

H. A thousand questions are occurring to me which I would like to ask you on this point. I will arrange them in my mind and ask them at some other time.

S. I shall be glad to answer them, for night and day I am working in this, my vocation, and nothing gives me more pleasure than to talk it over. Then I will also explain to you how the principles of our training have brought on the influenza.

H. The influenza? You are joking; that is an epidemic, which like all epidemics, appears at intervals.

S. That is true; an epidemic, which like all epidemics is regarded by the great mass of the people as a public calamity, descended from heaven. But a thorough investigator proves that the mode of living renders the soil susceptible to the epidemic. Next he proves that a change of habits will make it impossible for the epidemic to take

root. I tell you, the mode of life of our horses, due to our system of training, has brought on the influenza. In the times of FREDERICK THE GREAT there was no influenza; now it is increasing from year to year.

H. That too, you must explain to me yet in detail.

S. I shall be glad to, the next time.

[TO BE CONTINUED.]

CAVALRY UPON THE FIELD OF BATTLE; BY LIEUTENANT-COLONEL PREJENTSOFF, OF THE GENERAL STAFF OF THE RUSSIAN ARMY.

TRANSLATED FROM THE RUSSIAN,
BY FIRST LIEUTENANT GEORGE W. READ, FIFTH CAVALRY.

INTRODUCTION.

THE use of cavalry upon the field of battle in latter campaigns has been extremely limited. Concentrated in masses and placed at a distance from the fighting line, it appeared rather as a spectator than as a participant; the battle was begun, obstinately carried on, and for the most part finished by the infantry and artillery.

Such inertness has involuntarily forced many to the conclusion that the active part of this arm of the service in battle does not justify its maintenance in such considerable numbers, and that in war time it scarcely makes return for the enormous sums spent upon it in time of peace. Since the campaign of 1870–71, the question of the employment of cavalry in battle has more than once been discussed in military literature, with a view to determining whether it can have its former importance upon the battle-field; whether it may take an active part in the victory of future wars, showing the most energetic coöperation with the infantry, or whether it will be devoted exclusively to the service of security and information. Contemporaneous military literature is also occupied in considering these problems, and they are in the highest degree important, as upon the one or the other solution depends the establishment of the correct view, that cavalry possesses the greatest capacity for operations with the *arme blanche.*

The holding of certain views in regard to the active part in battle of any arm of the service, has an undoubted influence upon its training in peace time. It is therefore essential to determine *the kind of battle action in which the cavalry should be trained in time of peace*, and

the convictions with which its officers should be inspired, in order that they, with a firm faith in their system, may infallibly attain the final object.

Nothing is worse than vagueness or indefiniteness in the exercises of peace time, for in consequence of this, complete ignorance is shown in regard to the very things to be done in time of war. Doubt as to the possibility of certain operations will generate irresolution in all the actions of the cavalry in future campaigns, and will reduce its effects to a minimum. The existing fermentation of opinion with regard to the functions of cavalry is shown by the views of its directors themselves. Cavalry officers are gradually becoming imbued with the idea that it is impossible for their arm to take any active part upon the field of battle, and they refer with great doubt to its fruitful operations upon the theater of war in front of an army, on account of the extremely undeveloped contingent of non-commissioned officers. All this must lead to the complete downfall of the cavalry as an independent arm, and to its gradual degradation to the rôle of a simple accessory to the infantry.

Many contradictory views are expressed in current military literature in regard to the use of cavalry, and the idea is conveyed by not a few that the time for this arm of the service to take an active part upon the battle-field, particularly in masses, has been irrevocably dropped into eternity. Not sharing in the last idea, and claiming that cavalry has by no means lost its former importance in battle, we shall attempt, in the present article, to confirm our views by the choice of some instructive examples—from a positive or negative standpoint—from military history.

We deem it far from superfluous to touch with considerable detail upon the epochs of FREDERICK THE GREAT and NAPOLEON I, in consequence of the importance possessed by the cavalry in those days, and also to call to mind how these great generals understood the use of cavalry, and what enormous importance they gave this arm in general, and upon the field of battle in particular.

I. THE FUNCTION OF CAVALRY.

Cavalry upon the field of battle has always been designed chiefly for operations with the *arme blanche*, which, as is known, has existed without improvement since the most ancient times. The rapid improvement of fire-arms, and the general growth of technical knowledge in the present century, have given decisive importance to fire-arms in latter times.

All training in time of peace has become subordinated to the most careful instruction in firing, not only in the infantry and artillery but also in the cavalry, and a great portion of the time set apart for the instruction of the soldier is thus consumed. The improvement in fire-arms and the complete immutability of the *arme blanche*, together with the ease of proof in time of peace, by means of certain calculated percentages, of the results of training the men in firing and the utter impossibility of an estimate of the probabilities of action with the *arme blanche* in battle—have gradually led men to the false conviction that in future battles all will depend upon the knowledge let out at the enemy in heaps of projectiles.

The decided importance of the *arme blanche* in battle seems to be forgotten in time of peace, on account of the denial of the possibility of the immediate participation in the battle of its representative—the cavalry.

NAPOLEON I. said that the causes of victories and defeats, are first of all, in the heads and hearts of the soldiers and their commanders, *i. e.*, that in war, success depends chiefly upon the moral condition of the army. If it is sufficiently prepared and so trained that it is in condition, notwithstanding any losses, to come face to face with the enemy and attack him with the *arme blanche*, then, however fire-arms may be improved, bullets will not break the attacking columns of this army.

It is said that in the battles of the present, cavalry cannot attack undisordered infantry, as it will be shot to pieces ere it reaches, at full gallop, the object of the attack; and examples are cited of unsuccessful attacks in which bodies of cavalry have met with great losses. It seems to us, first of all, that *it is difficult to determine in battle what body of infantry is disordered, and what not*, as frequently and even for the most part, troops may appear in good trim from an exterior view, and meanwhile have suffered a considerable loss of moral strength.

We are firmly convinced that when a properly trained force of cavalry, attacking infantry, has decided to bring an engagement to an end (and when moving to the attack there is no involuntary shortening of the reins), it will reach the infantry at full gallop and break through it. It is not likely there will be great losses in this cavalry at the time of attack, even if the enemy's infantry discover it at 3,000 or 2,000 paces, as it is too movable for the infantry aim.

The losses in cavalry forces advancing to the attack and turning back without reaching the infantry, have taken place chiefly not

during the attack, but during the retreat. No one contends that in consequence of the permanent immutability of the *arme blanche*, and of the battle characteristics of the troops destined exclusively for its use, the active part of the cavalry in battle must also be immutable; the conditions under which cavalry is obliged to act in battle are considerably complicated, however, at present. Therefore, if it is desired to have the cavalry take an active part in battle, it is necessary that it be suitably trained in time of peace for operations under the more difficult situation in a modern battle.

Up to the time of FREDERICK THE GREAT, the Prussian cavalry took very little part in battle; in this respect it was defective. And in those times the opinion was expressed by military men that with the invention of fire-arms, cavalry had lost its importance upon the field of battle. But meanwhile, in about five or six years, FREDERICK raised the Prussian cavalry to unparalleled eminence. This was accomplished by a proper organization and by the judicious training of the cavalry in time of peace, and its corresponding use in battle.

The reign of FREDERICK THE GREAT is considered the epoch of the regeneration of cavalry, and the principles which guided the Prussian King in the improvement of this arm of the service were unchangeable up to his time, and have remained so to the present.

II. CAVALRY IN THE TIME OF FREDERICK THE GREAT.

In the Middle Ages, cavalry was of preëminent importance in all Europe. The infantry was a secondary, an auxiliary arm. The greater part of the troops were cavalry; it decided the fortune of battle. The infantry was charged with the defense of castles, towns, etc.

The invention of fire-arms changed the relation between infantry and cavalry, and the former began gradually to acquire the greater importance; this led to an increase of its numbers, as compared with the cavalry. Frightened by the weapon with which it seemed no courage would be able to grapple, it was supposed that the fearlessness of the individual had lost its force, and that only the ability of the commander to direct lines armed with guns could lead to victory, or that a greater number of guns would always overcome a lesser number.

The arming of all the infantry with the new weapon gave rise to an inclination to unite the advantages of the fire-arm and the *arme blanche;* the wish was manifested to organize mounted infantry,

i. e., bodies of troops possessing the mobility of cavalry and steadiness of infantry.

Those who were captivated by the efficiency of small arms fire, began, little by little, to lessen the importance of cavalry; in consequence, the *arme blanche* was removed from action, and the cavalry provided with guns and taught to shoot from the horse. This had little influence for good upon the cavalry fight, making it less decisive, and limiting the part of cavalry in battle. Even during the Thirty Years' War, (1618–1648), cavalry had ceased to be considered the principal arm of the service, although in separate engagements it still continued to exercise an influence upon the course of the battle.

From the end of the Thirty Years' War to the wars of FREDERICK THE GREAT, several substantial reforms were made in the cavalry, particularly with respect to its armament, and partly in the method of conducting an engagement. Its armament was more and more lightened, increasing its mobility, but even at this time, from the superiority of fire over the *arme blanche*, a cavalry attack continued to be regarded as unusual. The Austrians and their allies held as a principle, especially in their wars with the Turks, that the attack of the enemy's cavalry should be awaited in position with loaded carbines, (with which all the troopers were provided). The energetic attack of the Turkish cavalry was usually met in the best possible order, the closed ranks and lines opening a brisk fire, but on account of the skill of the Turks in wielding the saber and their mobility, they defeated the Austrian cavalry on most occasions.

While giving an enormous importance to fire-arms in battle, the conclusion was finally reached that cavalry was only good when it was able to shoot well. It began to receive more dismounted and very little mounted instruction. In the mounted order of battle, it fired in the same manner as on foot—volleys by rank—and a cavalry fight consisted principally of this firing. At a distance of about twenty-five paces from the enemy the attacking cavalry was halted, opened fire, and then moved forward to the attack at a trot.

Such was the condition in which FREDERICK II. found his favorite arm of the service, upon his accession to the throne in 1740. "No one was employed in the instruction of the cavalry," wrote the Prussian King in his memoirs, "as, in consequence of its unsuccessful use in battle, it was imagined that this arm of the service was hardly worth considering on account of its uselessness. This unfortunate prejudice was so ruinous to our cavalry, that, being left without discipline, it proved utterly worthless when there was occasion

for its use. It was unable either to move properly or to fight. Not a single drill took place, without troopers, thanks to their awkwardness and ignorance of riding, being thrown from their horses. The trooper was not master of his horse—being instructed more on foot than on horseback—but he fired excellently in both cases. *Cavalry officers had no conception of the cavalry service, and as was shown during the battle itself, were ignoramuses in theory and in practice.*"

At the beginning of his reign, however, FREDERICK gave special attention to the improvement of cavalry instruction, and fully understanding the function of this arm in battle, personally directed the training of his cavalry.

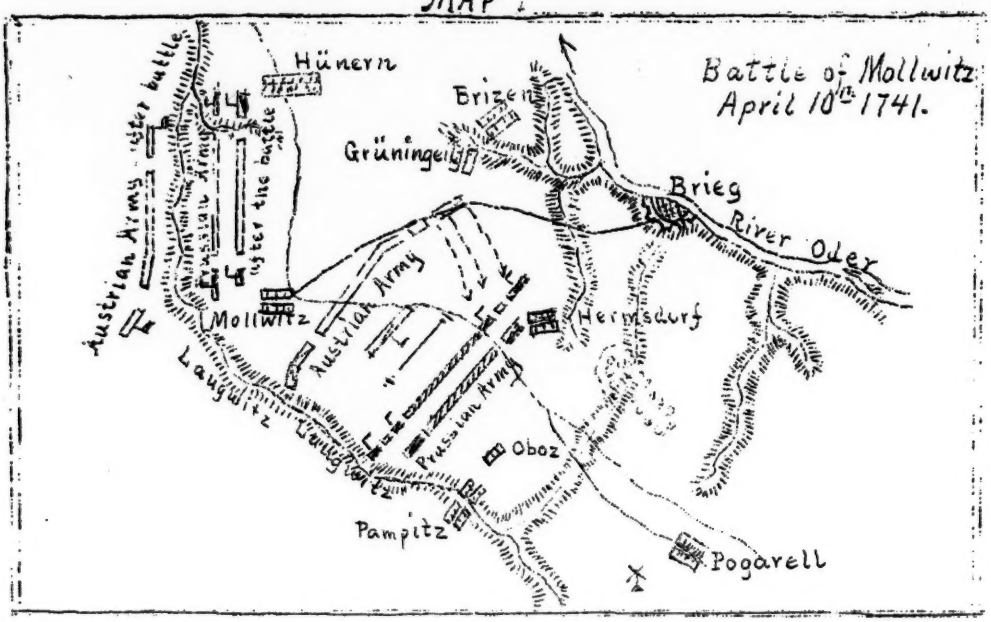
His first acquaintance with the Prussian cavalry in battle was made on the field of Mollwitz, where its deficiencies were very apparent. The occupation of Silesia in the winter of 1740–41, and the retirement from Jägerndorf to Mollwitz, presented no occasion for cavalry operations of importance. At Mollwitz, on the 10th of April, 1741, the Prussian King appeared for the first time as commander-in-chief of the army—the strength of which was twenty-seven battalions, twenty-nine squadrons of heavy cavalry, and three squadrons of hussars.

Moving with five columns, on the 10th of April, from Pogarell Mill, along the road to Ohlau (Map I), and making the advance with entire success, in spite of the foot or two of snow covering the ground, the Prussians were drawn up in battle order at 2,000 paces from the enemy, who occupied the defensive position of Mollwitz.

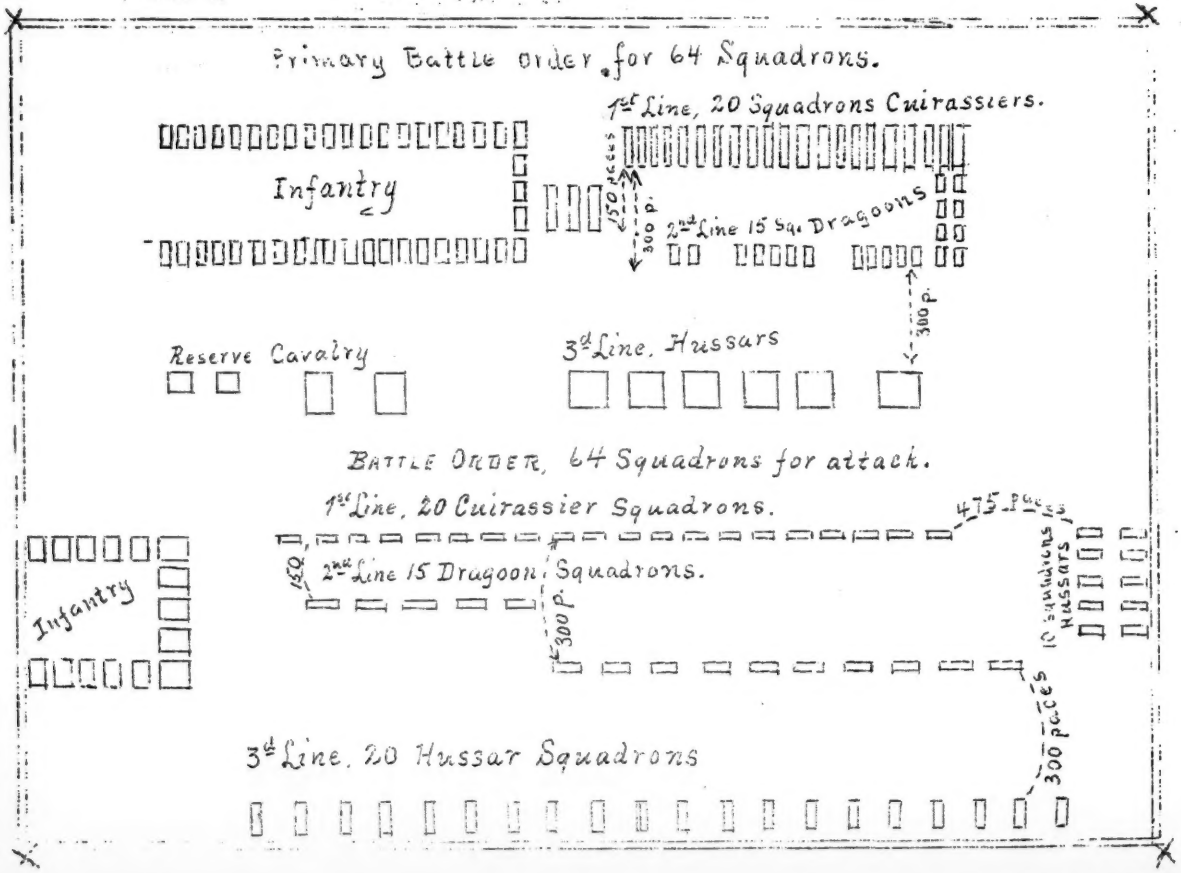
The Prussian infantry was in two lines, with the cavalry on the flanks. The right flank rested on the village of Hermsdorf and the left on the brook of Laugwitz, the banks of which were quite bold. For want of a place on the right flank, three battalions of the first line were thrown back and placed as a support to the right wing of the line of battle. On account of the enemy's superiority in cavalry, two grenadier battalions were placed between the cavalry squadrons of both flanks to give them greater security.

The Austrian cavalry, thirty squadrons strong, discovering the enemy, immediately attacked in columns the more exposed flank of the Prussian line. Galloping upon the ten Prussian squadrons of the right flank as they were being marched by squadrons to the right, to extend to the village of Hermsdorf, the Austrian cavalry overthrew them, but being met by the strong fire of the grenadiers, was obliged to abandon the pursuit and turn back for the attack of

MAP 1


Battle of Mollwitz
April 10th 1741.
Hünern
Brize
Grüningen
Brieg
River Oder
Austrian Army after battle
Austrian Army before the battle
Mollwitz
Austrian Army
Prussian Army
Herrnsdorf
Laugwitz
Laugwitz
Oboz
Pampitz
Pogarell

MAP 2


Primary Battle order for 64 Squadrons.
1st Line, 20 Squadrons Cuirassiers.
Infantry
150 paces
300 p.
2nd Line 15 Sq. Dragoons
300 p.
Reserve Cavalry
3d Line, Hussars
BATTLE ORDER, 64 Squadrons for attack.
1st Line, 20 Cuirassier Squadrons.
475 Paces
150
2nd Line 15 Dragoon Squadrons.
300 p.
10 Squadrons Hussars
Infantry
300 paces
3d Line, 20 Hussar Squadrons

the infantry. Thanks to the coöperation of the three battalions which happened to be behind the right wing of the Prussian line of battle, the Austrian attack was repulsed. At this time the operations of the Prussian cavalry upon the left flank were sufficiently successful. The persistent attacks of the Austrian cavalry were repulsed by the strong fire of the Prussian infantry, and a fortunate movement of the Prussian left wing against the flank of the Austrians led to the defeat of the latter and to their retreat from the field. The pursuit was very weak, as the Prussian cavalry suffered great loss in this battle.

These unsuccessful operations of the Prussian cavalry proved to the King that it needed a great deal of work yet before it could occupy a suitable place on the battle-field. "I found the cavalry too heavy and immobile," wrote FREDERICK in his "Memoirs" of the battle of Mollwitz. "I took advantage of the cessation of military operations to attend to its training, to make it capable of maneuvering, and to turn its immobility into rapidity. I aspired to have it acquire lightness and mobility and a conviction of its own superiority over the enemy; wherefore I sent it frequently to considerable distances in large bodies *in order to cultivate independence in the officers, to accustom them to command, and to accustom them also — when left to themselves — to rely upon their own strength.*"

Publishing various instructions and regulations for the guidance of the cavalry chiefs and officers, the Prussian King was sternly observant of their execution. For example, in the regulations of 1745, among other things, the following was announced in regard to the formations and movements of cavalry:

"All evolutions and movements of the cavalry must be executed with great rapidity, all deployments at the gallop. His Majesty most rigidly enjoins all commanders of cuirassier regiments *to give their attention and care exclusively to making good and steady troopers out of the ordinary recruit.* They should sit their horses with the ease of hussars, should know their horses well, and should wield the saber skillfully."

Every day, winter and summer, the soldier was obliged to ride. Each trooper was allowed to ride a single horse and to train him. In the training season, in summer, there were five mounted and one foot drill per week; one day in the week as well as Sunday was designated for training the horses. The King prohibited firing from horse-back, allowing it only as an exception during the pursuit:

"The troopers must be thoroughly imbued with the idea that the firing taught them upon drill must not be used before the first and second lines of the enemy have been destroyed by the saber.

"The squadrons upon hearing the signal of attack, rush upon the enemy, with weapons unsheathed and standards unfurled, while all the trumpeters play a march. At this time not a single squadron, at the peril of its honor and reputation, must dare to fire; on the contrary, all must fly upon the enemy, saber in hand. Brigade commanders will be responsible for this."

Although prohibiting firing from horse-back, the Prussian King took every precaution to have his cavalry skillful in making an impetuous attack in the closest order. The order of battle of the cavalry of that time (in one line, mixed with the infantry), was acknowledged by FREDERICK, from the beginning, to be unsuited to the fighting characteristics of this arm of the service; very soon, therefore (immediately after Mollwitz) he introduced into the Prussian cavalry an order of battle comprising strong bodies in two lines without intermixture with the infantry. The first line was composed of cuirassiers, the second of dragoons—the first being made considerably the stronger.

Within a year after Mollwitz, the Prussian cavalry was formed in three lines (at the battle of Czaslau.* 1742); the third line consisted of hussars, which up to this time had been used only in the scouting and guarding service. The second line was intended to support and develop the success gained by the first, and the third was to secure the flanks of the first two lines and the rear of the entire order of battle of the cavalry.

With reference to the execution of the attack, the following is contained in the instructions of 1744:

"When the general orders the attack, all the lines will begin to move at a walk, passing afterwards to a trot, and at a distance of 200 paces from the enemy—giving free reins and spurs—will take the run. Frightening yells may possibly be needed with greater strength in order to break through the enemy's lines; but in other respects the order of battle should be rigidly preserved so that all three lines shall be constantly at 300 paces distance, with the hussars on the flanks. It is impossible to expect that the enemy will be in a condition to withstand such an attack; it may rather be surmised that he will be thrown back upon his second line; hence the attack of the enemy's second line should follow the attack of his first line without stopping.

"When both the enemy's lines are completely disordered, the first rank of the first line should move in pursuit, together with the hussars upon the flanks. The remaining squadrons should close and halt in perfect order at 200 paces from the place of the attack. During the pursuit of the defeated enemy, the cuirassiers and hussars are not to permit him to recover his breath, but are to drive

*Also called Chotusitz.

him until a defile or dense wood is reached. Only through the observance of these conditions will the enemy suffer great loss. Should the pursued enemy scatter, an effort must be made to overtake the foremost; those who straggle will not escape. During the pursuit it is necessary to kill, to saber and to shoot, and only to begin taking prisoners when the pursuit may be considered at an end. In this connection the King orders the commanders of all the squadrons which are in the fight *to act independently after the first attack, and immediately collecting their squadrons, to again fall upon the enemy without awaiting commands or orders*, for the generals may have been killed in the action, or have lost their horses.

"In like manner, the obligation rests upon squadron commanders to act in their own front without giving attention to the flank bodies. It is necessary to observe as a general rule, however, never to detach the first rank for the pursuit until both the enemy's lines shall be overthrown, and this must be impressed upon every soldier. His Royal Highness calls attention to the fact that during the entire battle, squadron commanders should carry out these orders most strictly, and on no occasion after the first or second rencounter should they permit the enemy to rally, and in his turn fall upon their squadrons. On the contrary, each regimental or squadron commander, after the first attack, must not fail to again fall upon the enemy as soon as he is seen to be collecting himself, and is bound not to allow him to reörganize.

"The generals of the second line must observe that in case one of the squadrons of the first line be overthrown by the enemy, the second line may be always in readiness to support the squadron forced back, and to drive away the enemy. When both the enemy's lines are thrown back, the generals of the second line must not forget that while the enemy keeps his reserve, he can easily fall upon the flank of our first line; to avoid this it is necessary to throw out, 150 paces in advance of the second line, three or four squadrons of dragoons, so that they may project beyond the flanks of the first line. Thus the dragoons will always be in readiness to drive away the enemy's reserve, or even to defeat it, should it move against the flanks of our first line; in this case the commander of the second line can himself take the enemy's reserves in flank."

In these instructions the action of the lines of the order of battle of the cavalry is explained in detail, and one cannot fail to observe to what an important degree FREDERICK THE GREAT increased their reciprocal support.

In the instructions for the battle action of cavalry masses, the order of battle based exclusively upon the properties of the *arme blanche* and the peculiarities of cavalry fighting, stands out in bold relief. A thorough knowledge of the function of cavalry upon the field of battle was necessary to so correctly define its battle formation. Exacting from the cavalry impetuosity and unity in action

with the *arme blanche*, the Prussian King was mindful of its training in the execution of its maneuvers, with the object of the rapid assumption of the battle order.

Thus, in the instructions of 1748, he touches upon this question, among other things:

"In battle, the cavalry must quickly rush upon the enemy and attack him; this is one of its fundamental maxims, and is my standing order. Upon this basis special attention turns upon the quickest formation of the army in order of battle, so that it may be prepared to fight sooner than the enemy, and not permit him to forestall it. If our cavalry has already formed while the enemy is still in process of formation, its work is half done, when it attacks the enemy at this moment."

FREDERICK attached great importance to the initiative, and instructed his cavalry officers in that direction, suggesting to them continually that it is always necessary to anticipate the enemy, and never to await his action.

In the above cited extracts from FREDERICK's regulations, the leading idea of every system of instruction for cavalry in time of peace, is evident. Add to this that the King forbade the reception of foreigners into his cavalry, in consequence of which it was filled up from among Prussian land owners—and it is clear that the very structure of the regiments was cemented by moral ties. The best men were chosen for the hussar regiments intended for light cavalry service and for scouting.

In general, the Prussian cavalry under the supervision of its highly talented director, was soundly improved and was gradually prepared to become the model arm of the service in the performance of its battle functions. In consequence of the system of obtaining men and of the training adopted, the cavalry—from the moral qualities acquired—became more trustworthy than the recruited infantry, and in subsequent campaigns, with the able generals chosen by FREDERICK at its head, unquestionably took the first place among the three arms of the service.

In a majority of cases, the initiative was taken by the Prussians. FREDERICK's object in battle was not usually confined to the menace of the enemy by different maneuvers, but to his destruction, in which the numerous Prussian cavalry showed the greatest coöperation.

Giving great importance to the pursuit of the defeated enemy, the Prussian King invited the special attention of his generals to this in his regulations; for example, in the regulations of 1778, the following is said in this connection:

"The cavalry must show the greatest activity after the battle is won, as it is then charged with the persistent pursuit of the enemy. It is absolutely necessary that the cavalry shall always execute this. It is impossible to derive any advantage from victory if the cavalry does not finish the enemy—taking prisoners and destroying the retreating forces. During the pursuit officers can make themselves useful, not by sparing the horses, but by harassing the enemy until his strength is completely exhausted."

We also find in one of the King's letters to ZIETHEN:

"I enjoin you above all to pursue the enemy as long as strength lasts, without allowing him to rest or to bring his troops into order. I am fully convinced that your cavalry is fatigued, but bear in mind that the enemy is a thousand times more wearied still, and that it is absolutely necessary to drive him away without allowing him to slip from your hands. In our time, a single day's work more; afterwards, a rest for a hundred days. And so, General, without dismounting, follow upon the heels of the enemy."

At the time of FREDERICK'S accession to the throne, the Prussian cavalry consisted of 114 squadrons, organized into twenty regiments, numbering in all 13,000, as follows: Twelve regiments of cuirassiers, of five squadrons each; six regiments of dragoons, of from five to ten squadrons each; and two regiments of hussars, of three and six squadrons respectively. The proportion of cavalry to infantry was about one-fifth. At the end of FREDERICK'S reign, his cavalry comprised 224 squadrons, organized into thirty-five regiments, as follows: Thirteen of cuirassiers, of five squadrons each; twelve of dragoons, two regiments of ten squadrons and the remainder of five; ten of hussars, of about ten squadrons each—in all about 30,000. Its proportion to the infantry was one-fourth, and on special occasions it was increased to one-third of the effective force of the army.

In battle, the Prussian King grouped his cavalry into masses of twenty, thirty, and even fifty or more squadrons (depending upon their number), and placed them upon the outward flanks of the order of battle of the infantry. It was considered inexpedient to place the cavalry behind the infantry when the latter was formed for battle compactly along the front of the line with the regimental guns in the intervals. Besides the two cavalry masses upon the flanks, bodies of cavalry were sometimes placed near the infantry designated for the main attack, or behind the order of battle as a general reserve. Placing the cavalry upon the flanks was considered normal, because from there it was easy for its commander to observe the course of the battle and choose the opportune moment for the attack.

In view of the nature of cavalry and of its chief function upon the field of battle (operations with the *arme blanche*), the Prussian King declared its most suitable battle formation to be in three lines, one behind another (Map 2), with intervals of ten paces between the squadrons of the first line and of sixty paces between those of the second line, which was 300 paces distant from the first; the third line, 300 paces distant from the second, was disposed in platoon columns of hussars. On the outward flank of the first line was placed a hussar regiment of ten squadrons in columns of wings. The object of placing the hussars on the outward flank and in rear was to give freedom of action to the main mass of the cavalry while securing it from attack in flank and rear. The Prussian King permitted the prescribed normal order of battle of the cavalry masses to be somewhat altered, depending upon local conditions.

In such a formation, the Prussian cavalry in a majority of cases gained the victory over both the infantry and cavalry of the enemy. This order was afterwards modified; notably in 1770, when FREDERICK proposed the following battle order for the cavalry: the second line was not placed directly behind the first, but projected beyond one or both of its flanks, and the third projected beyond the second line, wherefore it seemed unnecessary to protect the outward flank by the hussar regiment.

Thus we see that FREDERICK THE GREAT, understanding the essentials of fighting cavalry, gave it a formation corresponding to its characteristics, and by degrees perfected it, working out from battle experience the same formation for cavalry, which in spite of the arguments against it, has been approached at the present time.

It follows from this that the immutability of the battle characteristics of cavalry as an arm of the service, gives it one and the same battle formation; the complex situation in a modern battle should be met, not by a change in the formation of the cavalry, but by the skill to adapt this formation to the more difficult conditions. The last, however, requires *the greatest development of mobility in the cavalry, and of the capacity to maneuver and handle it in masses.* Talented chiefs knew how to manage cavalry masses in the time of FREDERICK THE GREAT, although, perhaps, without a special military education; *but now talented cavalry commanders with solid military educations are necessary*, and cavalry officers of independence, skill and unparalleled daring.

The genius of FREDERICK was able to discover talented men among his subjects, and if the Prussian cavalry was indebted for the

brilliancy of its operations during the Seven Years War, to the King as its chief director in peace time, and its commander-in-chief in campaigns, no less was it served by his fellow champions and closest assistants in training the cavalry, viz: ZIETHEN and SEIDLITZ. Subsequent epochs failed to produce their equals as cavalry generals. Their system of conducting cavalry affairs is so eminently instructive that its principles might serve as a guide for the cavalry commanders of the present. ZIETHEN and SEIDLITZ possessed the inspiration which enabled them to foresee the final object without being confused by the accessory circumstances. Having the ability to handle masses of cavalry in battle, they did not lose sight of the many trifles, a knowledge of which they brought from their service in the subordinate grades, and thanks to which a commander always knows what may be demanded at a given moment from both horses and men.

The conclusion may be drawn from the above that FREDERICK THE GREAT alone in his time had the correct idea of cavalry as an arm of the service, and while accurately estimating its importance in battle and upon the theater of war, knew how to take suitable measures for its proper training in time of peace.

The Prussian King understood that only simplicity in the exercises of instruction in time of peace, and the use of cavalry in masses exclusively for action with the *arme blanche* in battle, could lead to good results. The tactics of his cavalry were to attack impetuously and to a finish, and to pursue the defeated enemy to the last limits, whence it was proposed to form the order of battle in several lines, independent of each other, within the limits of attaining the common end; to support the flanks by parts of the order of battle itself; to combine the frontal with the flank attack; to support the advanced parts by a reserve; to aim at the development of the greatest mobility in the cavalry masses, and of their ability to maneuver rapidly —*while uniting their administration in the person of a single chief, not the oldest in the service, but of proved abilities.*

It is necessary to add that for the instruction of cavalry in time of peace, FREDERICK organized riding schools, which up to his time did not exist in Prussia; looked after the individual training of the troopers; required the execution of drill upon cut up ground, and gave definite problems for maneuvers, *concluding every exercise by a criticism upon its execution.* By means of these peace time exercises with a strictly defined object, it became possible in battle to execute a timely attack with the *arme blanche* with the greatest swiftness and unity, whether against cavalry or infantry.

Among his generals and other officers the King aroused a love for military study, taking part, personally, in discussions upon various military operations, and thus improved the accurate *coup d'oeil* of the subordinates, developed their independence, and gradually prepared worthy cavalry commanders. To secure correct and uniform training, he published regulations and instructions, based upon battle experience. This was especially important, as up to his time almost every regiment had been trained in its own way.

The correct views of FREDERICK THE GREAT, upon the battle function of cavalry, have resulted in the survival without change, even to our time, of the fundamental principles created by him for the use of this arm of the service in battle.

[TO BE CONTINUED.]

GYMNASIUMS AND RIDING HALLS AT CAVALRY POSTS.

By Second Lieutenant U. G. KEMP, Eighth Cavalry.

"ACTIVITY, endurance and perfect bodily culture, too much neglected in our system of military training, are important requisites in a modern army. As elements, their possession must ever go far towards insuring success to that contestant having their advantage over an adversary without it. Considering the results depending upon the army, the demands it is expected to meet, and the care bestowed upon it, there is no community in which the cultivation of athletics is more necessary, or can be better promoted.

"It is a small body of well provided, healthy men, living much in the open air, and when active operations commence, is always called upon to do, and is expected to do well, an immense amount of work. Yet the supply of surplus strength that the ordinary military pursuits are able to store up is seldom such as to meet at once and fully the sudden, long continued demands so often put upon it. This, however, is only the fault of the present military system, and is open to immediate correction by the army itself. Let the skill with which the modern soldier has learned to use his rifle be supplemented by a proper cultivation of bodily strength and endurance.

"These requisites to military achievements will be as inevitably demanded of him upon the modern field of battle as they ever were of his ancient predecessor in arms in personal encounter. In their possession he will accomplish results otherwise impossible, and have, moreover, an invaluable reserve wherewith to meet whatever strain may come upon his powers.

"Interest in athletic games in this country is constantly increasing, and it cannot be doubted that military competitors can secure brilliant reputations, which will redound to the credit of the army, and the country as well.

"An interest to the individual soldier and an advantage to the service, as great and wide spread as that in target practice, may soon be expected to grow out of such contests. The field of competition is infinitely broader, and the opportunities of excelling all the greater. Hence, results as honorable to the soldier and as beneficial to the army as those attained on the rifle range may also be expected.*

*See Totten's "Laws of Athletics."

It has been said, and most properly, that the American is naturally an individualist. This is, in great part, a consequence of our institutions and form of government.

The cavalryman, more than any other person either in civil or military life, should have this characteristic promoted to its highest state of perfection; his development physically and mentally is an all-important consideration, and it is to his physical training in particular that this paper is devoted.

It is essential that the recruit be up to a certain standard, both mentally and physically, else he should not have been enlisted, and we may assume that we are dealing with men of fair intellects and good physique. Our aim is, or should be, to make of him the best possible soldier, in the least time, and have him attain a high degree of excellence in all the requirements that go to make a good cavalryman. Some of these requirements are, that first and foremost he be a good horseman, that he have a good eye, quick ear, and sound judgment.

A good horseman should have a thorough knowledge of a horse, as regards his treatment, care under all circumstances, and, above all he should be an excellent rider. Therefore anything that we can do for the cavalry recruit to make him confident of his own powers, independent and self-reliant when alone, or in other words, to develop that natural characteristic—individuality—is that much towards making him a good cavalryman.

We all know that a man, who is well developed physically is more confident and self-reliant than one who has had no training in that direction. One who has reached a high degree of physical excellence, has an eminent right to be so. Not that we want, of necessity, a corps of athletes, but we want men who have sufficient confidence in their physical capabilities, and control over their bodies, to give them a very important component of the modern cavalryman. Out-of-door exercises, such as foot-ball, base-ball, running, jumping, etc., have a wonderful influence, and are beneficial to the mental as well as the physical powers; but there are many essential exercises that require a sheltered place wherein they may be carried on. Regularity of exercise has much to do with results obtained, and besides, a place of this kind would be resorted to by the men, during their leisure hours, with both pleasure and profit to themselves. A gymnasium fitted up with the simplest appliances, would go far towards supplying this much needed want.

The setting-up exercises can be taught in the open air, as long as the weather is favorable; but at many posts this is sometimes im-

possible, and there is not sufficient space in the squad-room to properly instruct even a few men at a time. The drill-master should be a non-commissioned officer, proficient, not only as an instructor in the ordinary setting-up and manual drills, but he should be able to take the recruits through a course of gymnastics which should be made a part of the drill regulations.

There have been numerous books published on this subject, and from them it would be an easy matter to choose such exercises as would be directly suitable and beneficial to every man in the ranks, and the officers as well; for once established, the gymnasium would become as much a place of diversion for the officers as for the men. Should there be a building set apart for this purpose at each post, it would take but a short time and a nominal sum to have it in such shape as to render practicable a very great improvement in the physical condition of the recruit who, as a rule, finds it difficult to even mount his horse, not considering his ability to retain his seat, and handle himself and horse, when mounted.

It may be taken for granted that the recruit will, in the gymnasium, become more or less expert in the exercises of mounting and dismounting, vaulting and leaping on the dummy horse, and along with these could be taught various exercises on the horse bare-backed, and with the saddle, such as the reaches, facing to the front and rear, etc. Strength in the arms and wrists sufficient to bear the weight of the body, is gained by exercising on parallel bars and with dumb-bells. It may seem strange, but there are numerous instances where men, who otherwise are quite strong, cannot do the simplest exercise on horseback, because of their inability to sustain the weight of the body on the wrists or arms. This can, with but little practice, be acquired by any one; to see a man mounting a horse bare-backed and have to make two or three attempts is no uncommon occurrence. This is not entirely confined to recruits, either. Why is this? Simply because the man has had no instruction or training to prepare him for these apparently minor details.

Strength in these particular muscles is also gained in exercising with the saber, the cavalryman's very important weapon in the charge. This also could be introduced as a part of the course of gymnastics, and the use of the saber and foil, now so entirely neglected, would be a step in the direction of an advance that is certain to come in time.

After a course of two or three months in the gymnasium, the muscles are fairly well developed and under control.

With parallel and horizontal bars, clubs, dumb-bells, the saber

and foil, and a dummy horse on which many of the most important exercises can be taught, the recruit could be advantageously instructed in the first principles of riding.

In order that the saber be of any use in the hands of a mounted man, he must be such a rider that he can devote his whole attention to the use of his weapon, and not be compelled to use both of his hands to keep himself on his horse. You can judge of a man's riding to a great extent by the manner in which he mounts and dismounts. It is no uncommon occurrence to see a man, when mounting, fall into the saddle in a heap, as it were, instead of placing himself carefully in the seat and assuming immediate control of his mount, where as a rule, the horse is master of the situation, and does pretty much as he pleases for the time being. Fortunately most of our horses are sufficiently well trained on account of long continued service, and intelligent enough, to give but little trouble.

With his superior powers of intellect and judgment man can overcome and train the most vicious horses. This, of course, is not at all times required, but the cavalryman should be prepared for any emergency; and if he has sufficient confidence in himself, and has his physical and mental abilities fairly well developed, the average recruit can train his horse to be perfectly manageable under all circumstances. Once the horse is made to realize that his rider is master, there will be no further difficulty.

This part of the instruction is and must be accomplished in the riding hall, and it is needless to say that no one in our branch of the service will doubt for a moment the advantages, to both horses and men, to be derived from the riding hall drills and exercises.

The necessity for a riding hall training becomes apparent as soon as anything in the form of a charge is attempted. Even in our ordinary drills, if a charge is made, invariably there are horses scattered in every direction, and have the riders entirely at their mercy.

A few mounted exercises have been introduced into the new Drill Regulations, and form a basis for the instructor. He, however, should be allowed considerable latitude, and should not be required to confine himself to a limited number of movements. Every exercise that a man learns and executes successfully on horseback adds so much to his confidence in his horsemanship, and when that has reached a high degree of cultivation, he can get on his horse and feel at ease.

It may not be considered by many as an advantage to have horses trained to lie down, but in the training the horse and man have learned an invaluable lesson.

A man may never be required to run and jump on his horse from the rear, or vault clear over him in an actual encounter, but should there be competitions instituted, at which feats in horsemanship formed part of the programme, an interest would be developed among the different cavalry regiments, and troops also, that would, I doubt not, in time even surpass that shown in target competitions.

The cavalryman should be a good shot, but he should be a better rider, and when it is made an object for us to attain a high degree of proficiency in that most desirable and quite uncommon accomplishment, of being excellent and graceful riders, the question of interest will readily be answered. It is not intended to depreciate the horsemanship of our cavalry, for its standard is not beneath that of other countries, in fact, it surpasses most of them. But it will still bear a wonderful amount of improvement, and this can be accomplished by beginning with the recruit and cultivating his physical powers from the outset, leading him by successive steps through the gymnasium and riding hall to that perfect ease and confidence which mark the good rider, and which we all want to possess.

This century has been, and is certainly a progressive one, and the armies of all countries have not been slow to appreciate this fact. In modern arms and changes in tactics to meet those improvements, we have most striking evidences of the progress made in our profession. And with this progress, it becomes more and more necessary that each individual man should be taught to be self-reliant, and to stand on his own merits. This can be done in no better way than by training each and every man from the beginning; and let us hope that the Board of Officers, recently appointed to consider and report upon reading rooms, gymnasiums and other places of amusement for the enlisted man, will find it advisable to establish at least a gymnasium and riding hall at every cavalry post.

"JIGITOFKA" (COSSACK VAULTING).

By A. N. KOVRIGIN.

SECTION 144, of our Military Regulations, respecting active service of Cossacks, reads: "After obligatory exercises in vaulting with obstacles, voluntary vaulting should also be allowed. The conductor of such exercises must lead the good will and enterprise of the riders to useful and practical exercises, preferring them to aimless and risky vaulting, which, however considered, non-obligatory or voluntary, should nevertheless be permitted when it is undertaken by the personal initiative of Cossacks."

The "jigitofka" has long been practiced by this valuable element of the Russian troops, becoming known to it nearly simultaneously with its birth, and therefore such vaulting is to be considered as an absolutely natural appurtenance of Cossacks as cavalrymen by nature and not as a matter prescribed and inculcated in them by any regulations whatsoever, or frivolous ideas of killing leisure time in peace. It is possible, upon all accounts, to suppose that this sort of exercise has passed to the Cossacks from those martial mounted tribes with whom they once constantly struggled for the right of existence and from whom they gradually copied and appropriated those particular ways and battle qualities by which they have deserved the reputation of a bold and indefatigable natural cavalry.

Although these exercises, from the present decrease of the term of active service of Cossacks to four years, and increase of the programme of their general training, cannot be practiced so often as before, yet they are still considered strictly necessary and even more obligatory than many of the other subjects of their studies.

Not many, we trust, will object to the opinion that Cossack vaulting in general develops the fearlessness, skill and presence of mind, so peculiar to these people, and that it (if such expression can be employed) "fastens" the rider to the horse.

A good "jigit" (vaulter) feels himself as comfortable in the saddle as on the ground, and being well acquainted with the qualities of his horse makes use of every means to prevent its falling or other disagreeable casualties happening.

Those who have ever lived in "stanitzas" (Cossack villages) and have interested themselves in the training of Cossack boys and in their equipment for active service, have undoubtedly observed that a good vaulter is at the same time also a good rider, who, if his means allow him, enters the active service always well equipped with a good horse, saddle, etc. In this category of boys, we naturally do not include children of Cossack merchants, who sometimes also enter the service well equipped, but never have the qualities belonging to good "jigits," as at home they generally pass their lives behind the shop counter, and therefore are not inclined to participate in the general training of Cossacks.

On an attentive examination of the Cossack life in the "stanitza," one can easily indicate the Cossack children who promise to become valiant vaulters and riders; firstly you see them riding to the horse-pond, very often at a gallop and never slower than a trot, without either saddle or bridle; their eyes sparkle, and one clearly sees that the chap feels himself fully contented when he reaches the horse's back. In meeting a herd of horses you observe them racing, most of them being provided with a rope attached to their horse's neck to which they clutch during their first exercises in picking up anything from the ground at full gallop. Ask such a child to show you the best and fastest horses in the herd and he will surely point them out, as well as those which being also good are, nevertheless, useless for a Cossack, as they always fall when the rider practices throwing himself forward to the ground. Then you meet these children already enrolled in the preparatory section of Cossack troops in which they pass their first drilling assembly mounted on their own horses, well known to them by this time, and on which they fear neither falling to the ground nor crossing obstacles at full gallop, standing on the saddle, either on feet or head. After the drilling assembly is over they return from the camp with the name of "jigit," and their horses by this time are, of course, splendidly trained for performing their characteristic exercises at all gaits. The skillful and bold riders serve as an example to the less trained ones, and in this way vaulting during the period of early childhood and youth generally sufficiently develops many of the most essential qualities of a Cossack before entering active service.

Obligatory vaulting consists in—

1. Vaulting with obstacles, accompanied by firing and cutting in all positions.

2. The practice of throwing their horses while going at a gallop and immediately firing over them.

3. Exercises in lifting up and transporting wounded men at a gallop.

Non-obligatory or voluntary vaulting includes—

1. Exercises in falling forward to the ground.

2. Mounting and dismounting at full gallop.

3. Races, accompanied by leaping from one horse to another.

4. Exercises with obstacles, standing either on the head* or feet.

5. Galloping in groups of one or more upon one horse, with firing.

More time is naturally generally given to the most useful exercises, the final object of which is to develop in the Cossacks every accomplishment in the management of their horses and arms, deriving from them all that is required in order to defeat the enemy.

Quiet, firm and good shooting in every direction at any gait, using the saber in every position of the rider, rapid horse throwing with immediate firing from behind the horse, rapid mounting with unexpected saber attack—such are the results obtained by these exercises.

Tests have shown that it is not the sentiment of self-preservation, natural to every one, but the material question that obliges many Cossacks to dislike vaulting exercises: equipping himself for active service on his own account, the government supplying him only with a rifle, he naturally desires to preserve his own property, limiting the expenses for its repair as much as possible. In most cases it has been observed that falls while "jigiting" generally did more harm to the Cossack's horse and equipment than to the Cossack himself, and, in consequence thereof, his fear of spoiling the horse or breaking or tearing anything expensive to repair are just the circumstances that induce the Cossack to evade vaulting exercises, which sometimes do not meet with his sympathy in consequence of their destructiveness. The military department, in order to remove all obstacles hindering such exercises, intends to assist the Cossacks by covering all their expenses in the purchase of either horse or equipment spoilt or lost in vaulting; such means guarantee the development of "jigitofka," which, seeming so wild at the first appearance, can never be forgotten by those who have ever admired the skill with which it is performed.

*The rider in fact does not stand on his head but leans on the saddle with his shoulder.

In ending the description of Cossack vaulting we must mention another form of "jigitofka," which is being at present practiced by some of the Caucasian Cossack troops, and consisting in casting darts at a gallop, is called "djereet." The rider, either striking the ball or piercing the ring, covered with paper and having a diameter of thirty inches, hanging at about fifteen to twenty steps from him, must, while galloping, immediately turn his horse short and disappear from the article which has been pierced by his dart. "Djereeting," is, properly speaking, not new; it long ago existed among some of the mounted tribes of the East, and seems to have been temporarily forgotten.

These exercises have largely improved with our Cossacks who successfully participated in the great Tiflis "djereet" challenge in September last, taking the seven first prizes out of eight, and nine second prizes out of ten, the last one being gained by the same Tartar who took one of the first prizes. Representing no danger or risk, the "djereet" nevertheless requires skill, strength, accurate aim, and knowledge in managing the horse, which qualities are gradually obtained by both of the above exercises, the description of which we end with some remarks on the Cossack saddle.

The existing model of such a saddle requires a high tree and a seat on short stirrups, and in consequence thereof the rider seems to be sitting needlessly high.

Through such construction of the saddle the rider's feet are so placed in the stirrups that the middle of the ball of the foot falls in the same vertical plane with the ear, and the legs, through the shortness of the stirrups, seem to be needlessly bent.

These two circumstances produce the impression that the Cossack seat seems forced, unnatural (or wild, as they call it in St. Petersburg), and bring forth the following reflections among the representatives of our regular cavalry: A high tree places the rider too far from the horse, making the balancing difficult, and the short stirrup embarrasses the management of the horse with the thighs.

The Cossacks, in discussing this opinion, maintain that a high tree obliges the rider to regard more assiduously the center of gravity, and the short stirrup, producing some defect in the eyes of a stranger, gives a stronger support, and that both these peculiarities of its construction make the rider sit firmly, although in a somewhat constrained manner, in the saddle. Moreover, such a seat almost entirely removes all unsteadiness in the saddle, and therefore the horse, being relieved of such involuntary balancing of the rider, carries its burden more easily.

In the cavalry saddle, where there is a deep seat (nearer to the horse), the rider undoubtedly balances easily, and the long stirrup enables him to manage the horse with the thighs, but these "supposed advantages" are seldom useful outside the manège. When long distances are to be covered, the natural weariness resulting from them (these same advantages, deep seat and long stirrup), lead, in the Cossack's opinion, to the fact that the rider, having no strong support, begins to sit unsteadily in the saddle through fatigue, which, in its turn, brings a needless weariness to both horse and rider. This has a significance, especially in movements at a trot; the cavalry trot is considered heavy even by the Regulations, so it was necessary to introduce a lessened trot, in comparison with which the Cossack trot must be acknowledged altogether light.

Such a conclusion must, in our opinion, be attributed to the fact that the Cossack, strongly resting his feet against the stirrups when in his saddle, removes needless balancing movements, and produces the impression of complete harmony of movement with the horse, forming *one whole* with it.

Many Cossacks, entirely defending the construction of their saddle, nevertheless do not consider its present model as an irreproachable one, and have raised the question of increasing the height of the tree, in order that the saddle-cloth attached to it may give a more free circulation of air next to the back, and of lengthening the sides of the tree, for the purpose of increasing the surface of the saddle's contact with the horse's back, and thus proportionally distribute the weight of the burden carried by the horse.

St. Petersburg, April 23, 1892.

BOOK NOTICES AND EXCHANGES.

REVUE DU CERCLE MILITAIRE. 1892.

No. 9: The German Manual of the Lance (illustrated). Operations and Antiseptic Dressings in Armies (illustrated). No. 10: Operations and Antiseptic Dressings in Armies (continued). Notes on the Austro-Hungarian Army. No. 11: Garrison Life in the British Army. Notes on the Austro-Hungarian Army. No. 12: Mounted Firing in Russia. Operations and Antiseptic Dressings in Armies (continued). No. 13: Notes on the Austro-Hungarian Army (concluded). Operations and Antiseptic Dressings in Armies (continued), illustrated. No. 14: Practical Instruction at the Military Academy of Toledo (illustrated). Operations and Antiseptic Dressings in Armies (continued). Making the Squadron the Administrative Unit in the British Cavalry. No. 15: Practical Instruction at the Military Academy of Toledo. Infantry Combat Tactics. No. 16: Employment of Railways in the Turco-Russian War (illustrated). Infantry Combat Tactics. The "Lava" of the Cossacks and their Methods of Fighting. The Employment of Railways in the Turco-Russian War. No. 19: The "Lava" of the Cossacks and their Methods of Fighting. The Employment of Railways in the Turco-Russian War (concluded). No. 20: The "Lava" of the Cossacks and their Methods of Fighting. A New Small-Caliber Rifle in Spain. No. 22: The "Lava" of the Cossacks and their Methods of Fighting.

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No. 20: Hoenig's Twenty-four Hours of Moltke's Strategy. How to Improve, Without Expense, the Soldier's Fare. No. 21: Field Service of Infantry. War Studies by Verdy du Vernois. No. 22: Conclusion of the two preceding articles. No. 23: Moltke's Military Correspondence. Firing While Advancing. No. 24: What Can be Done in Battle by Field Artillery Maneuvering by Brigades. No. 25: Continuation of Preceding. The Winter Campaign of 1807 in Prussia (with maps). No. 27: The French Cavalry Maneuvers of 1891. No. 28: Russian Artillery Against Cavalry. Winter Marches in Russia. No. 29: A Vital Question for Field Artillery. No. 30: The Organization of French Provincial Armies in 1870–71. No. 34:

Continuation of the preceding. No. 36: English Quick-Firing Guns. Instruction in the Russian Army, Formerly and Now. No. 37: Ballooning in the French Maneuvers of 1891. Continued in No. 38. No. 39: The Military Situation in Upper Egypt. No. 40: The Steinbrecht-Plinzner System of Equitation and Training, and Instruction in Training Horses. No. 40: War Dogs in Tonquin. No. 41: The War of 1806–7. The Krupp Rapid-Firing Guns. No. 43: The Cavalry School at Saumur. No. 45: Remounts. No. 46: Russian Literature on Mounted Cavalry Firing.

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May: Wagon and Rail Transportation, by Captain H. R. Brinkerhoff, Fifteenth U. S. Infantry. Napoleon the Third at Sedan, by Archibald Forbes. History of First Fight and Organization of Stonewall Brigade, by D. B. Conrad, M. D. Civil Employment of Troops, by John C. Gresham, First Lieutenant Seventh Cavalry. Captain T. O. Selfridge, jr., U. S. Navy (with portrait). June: Europe in 1890–91, by S. B. Holabird, Brigadier General, U. S. Army (retired). Marshal Massena, by Edward Shippen, Medical Director, U. S. Navy. The Attack on Pine Ridge Indian Agency, S. Dakota, by Thomas H. Wilson, First Lieutenant Second U. S. Infantry. On Our Army, by General Sir Archibald Allison, Bart, G. C. B. Rear-Admiral Samuel Phillips Lee, U. S. Navy (with portrait).

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March: Military Ballooning, by Lieutenant H. B. Jones, R. E. April: The Telephone at Home and in the Field, by Major C. F. Beresford, R.E. The Reconnaissance of a Railway: Its Utilization and Destruction in Time of War, by Colonel J. S. Rothwell, R. A. The Employment of Photography in Reconnaissances, by Lieutenant F. J. Davies, Grenadier Guards. Modern Rifle Bullets and their Effects, by Brigade Surgeon Lieutenant-Colonel C. H. G. Godwin, Professor of Military Surgery, Army Medical School. May: Pigeons for Land and Sea Service, by W. B. Tegetmeier, Esq. Military Band Organization, by Colonel T. B. Shaw-Hellier. Field Howitzers and Mortars, by Lieutenant-Colonel N. L. Walford, R. A.

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